CALIBRATION AND SERVICING HANDBOOK

1061 & 1061 A

datron

digital voltmeter

CALIBRATION AND SERVICING HANDBOOK

for

THE DATRON AUTOCAL 1061 and 1061A DIGITAL VOLTMETERS

(for operating procedures
refer to the User's Handbook)

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For any assistance contact your nearest Datron Sales and Service office.
Addresses can be found at the back of this handbook.

Due to our policy of continuously updating our products, this handbook may contain minor differences in specification, components and circuit design to the instrument actually supplied. Amendment sheets precisely matched to your instrument serial number are available on request.

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Zero
Gain
Ib
Ac Hf
Lin.
CALIBRATE

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SECTION 1

CALIBRATION

1.1 INTRODUCTION

1.1.1 General

The purpose of calibration is to take account of any long-term drifts in the components of the instrument and to restore the accuracy, traceable to a known standard.

The period between calibrations depends upon the accuracy performance required from the instrument and for guidance, guaranteed accuracies for 24 hours, 90 days and 1 year are quoted.

The calibration procedures presented in the following pages should cater for most calibration situations. If, however, a special problem arises, please contact our Customer Service Section.

1.1.2 The Essentials for Good Calibration

Temperature - So that the instrument can meet its specification over the quoted temperature range, the temperature environment should be stabilised at 23°C ± 1°C. In addition, temperature gradients around the instrument should be considered, therefore calibrate the instrument in its normal operating position and allow plenty of room for ventilation.

Warm up - It is essential that the instrument has fully temperature stabilised if the best results from calibration are to be achieved. Therefore, at least a 2 hour warm-up period is recommended during which time the line supply or the covers should not be removed even for a short period. In addition, if the covers have been removed, make certain that they are correctly fitted and that the leaf contacts to the Earth and Guard Shields are in good shape.

Calibration Source - To perform a useful calibration the accuracy of the source should always be at least four times that of the instrument being calibrated. In most cases, examples of likely sources are given for each calibration function.

With some calibration sources, the output may take several seconds to settle to a final value, therefore unless a shorter settling time is assured, a period of 10 seconds is recommended before each calibration operation.

Guarding - It is preferable to arrange for the DVM to be calibrated with 'Local Guard' selected. Furthermore to arrange for the 'Lo' terminal of the DVM to remain at 'earth' throughout and let the calibration source float. If a 'Remote Guard' connection is necessary then examples are shown in the Operating Manual.

1.1.3 The 'AUTOCAL' Process

1.1.3.1 General

The Datron 'AUTOCAL' process means that complete calibration of AC, DC, Ohms and Current on every range can be carried out from the instruments own front panel. In the process, an internal non-volatile memory stores calibration constants for each function and range as determined when the instrument takes a series of 16 readings of the applied calibration source. Internally, each of the readings is deviated by one sixteenth of a digit and when an average is taken, the instrument is able to resolve to better than one least significant digit displayed.

Access to the non-volatile memory is gained using a key inserted into the rear panel. When calibration is complete, the key is removed, therefore preventing accidental or unauthorised use of the calibration routine.

1.1.3.2 Procedure Outline

- Select the 'FUNCTION' and 'RANGE' to be calibrated and cancel any 'MODE' or 'COMPUTE' buttons.

- Cover the 'COMPUTE' buttons with the stick-on 'CALIBRATE' overlay provided. Insert the key into the 'CALIBRATE ENABLE' keyswitch on the rear panel and turn to the 'CAL' position. (The 'cal' legend will be displayed on the front panel.)

If the instrument is fitted with Option 50 IEEE Bus, set the rear panel address switch to 31 i.e. all 1's.

- Connect the calibration source to the input terminals and operate the keys shown in the tables in the following pages. When a 'CALIBRATE' button is operated, its associated L.E.D. indicator will light and extinguish when the calibration operation is executed.

- When all calibration is complete turn the keyswitch to 'RUN' and remove the key.

1.1.3.3 The Five 'AUTOCAL' Keys

'Zero' - This takes account of offsets in the instrument and in the calibration source.

'Gain' - This sets a scaling factor for each range and function.

'Ib' - This nulls the input bias current of the DC voltage measurement circuits to around 10pA. Therefore it only has a significant effect on the low DC voltage ranges and high resistance Ohms ranges. It can be operated as often as required and independently of other calibration operations. It will be seen that successive operations of 'Ib' approach the final nulled value of current iteratively.

'AcHf' - This flattens the response of the A.C. amplifier used for AC voltage measurement. It should only be used when a full calibration i.e. 'Zero', 'Gain' and 'AcHf' is carried out. As with 'Ib' the calibration action is iterative and requires several operations of the key to complete.

'Lin' - This is an important calibration operation as it optimises the basic linearity of the internal measurement circuitry used for all ranges and functions. It must be used before any DC voltage or Ohms calibration is carried out.

1.1.3.4 'AUTOCAL' using 'KEYBOARD'

This is an extension of the 'AUTOCAL' process which is useful when using a calibration source set to a nominal value but with known errors. This means for example that calibration directly to a standard cell is possible. A full explanation of the procedure is covered in section 1.7.

1.1.3.5 'AUTOCAL' over the Bus

Each of the five calibration operations can be controlled using Option 50, the IEEE bus. This means that the instrument can be entirely calibrated remotely or under program control. As mentioned in the 'Procedure Outline' for a manual calibration, the rear panel address switch should be set to 31, i.e. all 1's. When a bus calibration is required the address switch must be set to the address number assigned to the DVM in the system. More details of calibration with the bus are included in section 1.8.

1.1.3.6 'Error 4'

If during calibration 'Error 4' is displayed, this indicates that the Calibration Source deviates too far from the calibration span of the instrument. Under these circumstances, the calibration memory is not updated and the instrument goes into 'Hold' with the calibration button calibration key LED remains on.

In the case of 'Zero', 'Gain' or 'AcHf' the Calibration Source should be checked and the same 'CALIBRATE' key repressed. The 'Hold' mode may be released any time and the instrument will free run again. If 'Error 4' follows 'Ib' or 'Lin' or persistently appears following 'Zero', 'Gain' or 'AcHf' then an instrument failure may have occurred. Therefore either consult our Customer Service Section or the Servicing Section of this Handbook.

1.2 DC VOLTAGE CALIBRATION

1.2.1 General

The procedure in the table opposite is all that is necessary to completely 'AUTOCAL' the DC voltage function. Steps 1 and 2 affect the accuracy on all ranges and should therefore be carried out even if just one range is being calibrated.

On each range a 'Zero' and 'Gain' calibration is required for each polarity of input. The two 'Zero' calibrations are included to overcome a possible zero difference with the polarity setting of the DC calibration source.

If the 'DVM Reading After Calibration' is not in accordance with the table, repeat operations of the same 'CALIBRATE' key are permissible. Where no tolerance is shown in this column, only the exact reading quoted with an occasional least significant digit showing is to be expected.

1.2.2 Equipment Required

- 1MΩ 'Lin' Source. This is a 1MΩ 5% resistor in parallel with a 1nF capacitor, shielded to reduce noise interference.

- 10MΩ 'Ib' Source. This is a 10MΩ 5% resistor in parallel with a 1nF capacitor, shielded to reduce noise interference.

Datron products, number 400391 and 400392, are available as 'Lin' and 'Ib' sources and are recommended.

- A DC Calibration Source. e.g.:— Fluke 332D with a 100:1 (5ppm) divider for producing a 100mV source.

1.2.3 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the 'Specification Verification' section of the User's Handbook will be useful; it provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

DC VOLTAGE CALIBRATION

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	Linearity	1MΩ Lin Source	DC,1 Filter	'Lin'	<10 digits	This calibration step may take around 30 seconds to complete
2	Input Bias Current	10MΩ Ib Source	DC,.1	'Ib'	<100 digits	Each subsequent operation of 'Ib' should approximately halve the DVM reading
3	10V Range Zero	+0.0000V	DC,10	'Zero'	±0.0000V	
4	10V Positive Full Range	+10.0000V	DC,10	'Gain'	+10.0000V	
5	10V Range Zero	–0.0000V	DC,10	'Zero'	±0.0000V	
6	10V Negative Full Range	–10.0000V	DC,10	'Gain'	–10.0000V	
7	1V Range Zero	+0.00000V	DC,1	'Zero'	±.00000V	
8	1V Positive Full Range	+1.00000V	DC,1	'Gain'	+1.00000V	
9	1V Range Zero	–0.00000V	DC,1	'Zero'	±.00000V	
10	1V Negative Full Range	–1.00000V	DC,1	'Gain'	–1.00000V	
11	.1V Range Zero	+0.000mV	DC,.1	'Zero'	±0.000mV ±1 digit	Wait for the reading to stabilize before operating 'Zero'
12	.1V Positive Full Range	+100.000mV	DC,.1	'Gain'	+100.000V ±1 digit	
13	.1V Range Zero	–0.000mV	DC,.1	'Zero'	±0.000mV ±1 digit	Wait for the reading to stabilize before operating 'Zero'
14	.1V Negative Full Range	–100.000mV	DC,.1	'Gain'	–100.000V ±1 digit	
15	100V Range Zero	+0.000V	DC,100	'Zero'	±0.000V	
16	100V Positive Full Range	+100.000V	DC,100	'Gain'	+100.000V	
17	100V Range Zero	–0.000V	DC,100	'Zero'	±0.000V	
18	100V Negative Full Range	–100.000V	DC,100	'Gain'	–100.000V	
19	1000V Range Zero	+0.00V	DC,1000	'Zero'	±0.00V	
20	1000V Positive Full Range	+1000.00V	DC,1000	'Gain'	+1000.00V	⚡ Lethal voltages present - increase calibration source in 100V steps if possible
21	1000V Range Zero	–0.00V	DC,1000	'Zero'	±0.00V	
22	1000V Negative Full Range	–1000.00V	DC,1000	'Gain'	–1000.00V	⚡ Lethal voltages present - increase calibration source in 100V steps if possible

1.3 OHMS CALIBRATION

1.3.1 General

The procedure in the table opposite is all that is necessary to completely 'AUTOCAL' the Ohms function. If just the Ohms or just one range of the Ohms is to be calibrated, then steps 1 and 2 in the DC Voltage Calibration table should be carried out first. Then on each Ohms range just a 'Zero' and 'Gain' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table, repeat operations of the same 'CALIBRATE' key is permissible to improve the reading. Where no tolerance is shown in this column, only the exact reading quoted with an occasional least significant digit showing is to be expected.

1.3.2 'Zero' Resistance Source

For accurate 'Zero' calibration on Ohms it is ESSENTIAL that a correctly connected zero source is used. Two arrangements are necessary as shown in Fig. 1.1; it can be seen that '4 wire Ω' selection is recommended on all ranges.

1.3.3 Equipment Required

A set of resistance standards from 10Ω to 10MΩ in decades; it is essential that 10Ω to 100kΩ standards are 4 terminal devices.

1.3.4 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the 'Specification Verification' section of the Operating Handbook will be useful. It provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

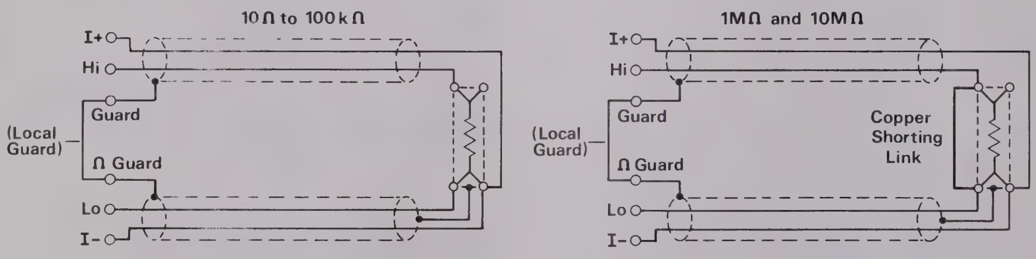


Fig. 1.1 ZERO RESISTANCE SOURCE CONNECTIONS

OHMS CALIBRATION TABLE

Step	Calibration Operation	Calibration Source	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	10Ω Range Zero	4 wire zero	kΩ, 4 wire, 10Ω	'Zero'	±0.0000Ω ±1 digit	Wait for the reading to stabilize before operating 'Zero'
2	10Ω Full Range	10Ω [1] Standard Resistor	kΩ, 4 wire, 10Ω	'Gain'	10.0000Ω ±1 digit	Wait for the reading to stabilize before operating 'Gain'
3	.1kΩ Range Zero	4 wire zero	kΩ, 4 wire, .1	'Zero'	±0.000Ω	
4	.1kΩ Full Range	100Ω [1] Standard Resistor	kΩ, 4 wire, .1	'Gain'	100.000Ω	
5	1kΩ Range Zero	4 wire zero	kΩ, 4 wire, 1	'Zero'	±.00000kΩ	
6	1kΩ Full Range	1kΩ [1] Standard Resistor	kΩ, 4 wire, 1	'Gain'	1.00000kΩ	
7	10kΩ Range Zero	4 wire zero	kΩ, 4 wire, 10	'Zero'	±0.0000kΩ	
8	10kΩ Full Range	10kΩ [1] Standard Resistor	kΩ, 4 wire, 10	'Gain'	10.0000kΩ	
9	100kΩ Range Zero	4 wire zero	kΩ, 4 wire, 100	'Zero'	±0.000kΩ	
10	100kΩ Full Range	100kΩ [1] Standard Resistor	kΩ, 4 wire, 100	'Gain'	100.000kΩ	
11	1000kΩ Range Zero	4 wire zero	kΩ, 4 wire, 1000 Input Filter	'Zero'	±0.00kΩ	
12	1000kΩ Full Range	1000kΩ [1] Standard Resistor	kΩ, 4 wire, 1000 Input Filter	'Gain'	1000.00kΩ ±1 digit	
13	10MΩ Range Zero	4 wire zero	kΩ, 4 wire, 10MΩ Input Filter	'Zero'	±0.0000MΩ	
14	10MΩ Full Range	10MΩ [1] Standard Resistor	kΩ, 4 wire, 10MΩ Input Filter	'Gain'	10.0000MΩ ±5 digits	

[1] - With Standard Resistor sources it may be useful to use the 'KEYBOARD' method of calibration - see section 1.7

1.4 AC VOLTAGE CALIBRATION

1.4.1 General

The procedure in the table opposite is all that is necessary to completely 'AUTOCAL' the AC voltage function. On each range just a 'Zero', 'Gain' and 'AcHf' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table, repeat operation of the same 'CALIBRATE' key is permissible to improve the readings. This will be necessary with the AcHf key.

1.4.2 Equipment Required

A copper shorting link and an AC calibration source e.g. Fluke 5200A and 5215A.

1.4.3 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the 'Specification Verification' section of the Operating Handbook will be useful. It provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

AC VOLTAGE CALIBRATION TABLE

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	DC coupled AC Zero	Copper Shorting link	AC,DC,.1	'Zero'	0.000mV ±3 digits	Set 'Local Guard'. Do not set 'Input filter'. Wait for reading to stabilize before operating 'Zero'
2	.1V Range Zero	Copper Shorting link	AC,.1	Check only	<100 digits	
3	1V Range Zero	Copper Shorting link	AC,1	'Zero'	.00000V ±1 digit	
4	10V Range Zero	Copper Shorting link	AC,10	'Zero'	0.0000V ±1 digit	
5	100V Range Zero	Copper Shorting link	AC,100	'Zero'	0.000V ±1 digit	
6	1000V Range Zero	Copper Shorting link	AC,1000	'Zero'	0.00V ±1 digit	
7	10V Full Range LF	10V rms 500 Hz	AC,10 Input Filter	'Gain'	10.0000V ±1 digit	Select 'Input filter' for remaining steps
8	10V Full Range HF	10V rms 30 kHz	AC, 10 Input filter	'AcHf'	10.0000V ±5 digits	
9	1V Full Range LF	1V rms 500Hz	AC,1 Input filter	'Gain'	1.00000V ±1 digit	
10	1V Full Range HF	1V rms 30 kHz	AC,1 Input filter	'AcHf'	1.00000V ±5 digits	
11	.1V Full Range LF	.1V rms 500 Hz	AC,.1 Input filter	'Gain'	100.000mV ±2 digits	
12	.1V Full Range HF	.1V rms 30 kHz	AC,.1 Input filter	'AcHf'	100.000mV ±5 digits	
13	100V Full Range LF	100V rms 500 Hz	AC,100 Input filter	'Gain'	100.000V ±1 digit	
14	100V Full Range HF	100V rms 30 kHz	AC,100 Input filter	'AcHf'	100.000V ±5 digits	
15	1000V Full Range LF	1000V rms 500 Hz	AC,1000 Input filter	'Gain'	1000.00V ±1 digit	⚡ Lethal voltage present. - increase calibration source in 100V steps if possible
16	1000V Full Range HF	1000V rms 20kHz	AC,1000 Input filter	'AcHf'	1000.00V ±5 digits	⚡ Lethal voltage present - increase calibration source in 100V steps if possible. DO NOT EXCEED 25 kHz

1.5 DC CURRENT CALIBRATION

1.5.1 General

The procedure in the table below shows all that is necessary to completely 'AUTOCAL' the DC Current function. If just the DC Current or just one range of DC Current is to be calibrated, then step 11 to 14 of the DC Voltage Calibration table should be carried out first. Then on each DC Current range just a 'Zero' and 'Gain' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table then repeat operation of the same 'CALIBRATE' key is permissible to improve the reading. Where no tolerance is shown in this column, only the exact reading quoted with an occasional least significant digit showing is to be expected.

1.5.2 Equipment Required

A DC Current calibration source.

1.5.3 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the 'Specification Verification' section of the Operating Handbook will be useful. It provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

DC CURRENT CALIBRATION TABLE

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	.1mA Range Zero	0.000μA	DC,I,.1	'Zero'	±0.000μA ±1 digit	Do not select 'Input filter'
2	.1mA Full Range	+100.000μA	DC,I,.1	'Gain'	+100.000μA ±2 digits	
3	1mA Range Zero	0.00000mA	DC,I,1	'Zero'	±.00000mA ±1 digit	
4	1mA Full Range	+1.00000mA	DC,I,1	'Gain'	+1.00000mA ±2 digits	
5	10mA Range Zero	0.0000mA	DC,I,10	'Zero'	±0.0000mA ±1 digit	
6	10mA Full Range	+10.0000mA	DC,I,10	'Gain'	+10.0000mA	
7	100mA Range Zero	0.000mA	DC,I,100	'Zero'	±0.000mA	
8	100mA Full Range	+100.000mA	DC,I,100	'Gain'	+100.000mA	
9	1000mA Range Zero	0.00mA	DC,I,1000	'Zero'	±0.00mA	
10	1000mA Full Range	+1000.00mA	DC,I,1000	'Gain'	+1000.00mA	

1.6 AC CURRENT CALIBRATION

1.6.1 General

The procedure in the table below shows all that is required to completely 'AUTOCAL' the AC Current function. If just the AC Current or just one range of AC Current is to be calibrated, then steps 1, 2, 11 & 12 of the AC Voltage Calibration table must be carried out first. Then on each range just a 'Zero' and 'Gain' calibration is required.

If the 'DVM Reading After Calibration' is not in accordance with the table then repeat operations of the same 'CALIBRATE' key is permissible to improve the reading.

1.6.2 Equipment Required

An AC Current calibration source at 1kHz.

1.6.3 Checking Accuracy after 'AUTOCAL'

To check the accuracy after 'AUTOCAL' the specification Verification section of the Operation Handbook will be useful. It provides tables for quick reference of accuracy on all ranges and functions in displayed digits.

AC CURRENT CALIBRATION TABLE

Step	Calibration Operation	Calibration Source Output	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	DC coupled AC Zero	No connections to DVM input terminals	I,DC,AC,.1	'Zero'	0.000μA ±5 digits	Do not select 'Input filter'
2	.1mA Range Zero	"	I,AC,.1	Check only	<±100 digits	Cancel DC coupled
3	1mA Range Zero	"	I,DC,AC,1	'Zero'	.00000mA ±5 digits	
4	10mA Range Zero	"	I,DC,AC,10	'Zero'	0.0000mA ±5 digits	
5	100mA Range Zero	"	I,DC,AC,100	'Zero'	0.000mA ±5 digits	
6	1000mA Range Zero	"	I,DC,AC,1000	'Zero'	0.00mA ±5 digits	
7	.1mA Full Range	100μA, 1kHz	I,DC,AC,.1	'Gain'	100.000μA ±10 digits	
8	1mA Full Range	1mA, 1 kHz	I,DC,AC,1	'Gain'	1.00000mA ±10 digits	
9	10mA Full Range	10mA, 1 kHz	I,DC,AC,10	'Gain'	10,0000mA ±10 digits	
10	100mA Full Range	100mA, 1 kHz	I,DC,AC,100	'Gain'	100,000mA ±10 digits	
11	1000mA Full Range	1A, 1 kHz	I,DC,AC,1000	'Gain'	1000.00mA ±10 digits	

1.7 CALIBRATION USING 'KEYBOARD'

1.7.1 General

The 'KEYBOARD' method of calibration is useful when a calibration source although set to a nominal value has known errors. In this situation the known value of the calibration source can be entered into the DVM before the 'AUTOCAL' process is executed. The process is functional during any calibration with a source of magnitude between 20% and 200% of the range selected, but it should be noted that for equal magnitude source errors, calibrating at the lower percentage end of range produces a higher percentage calibration error. The 'KEYBOARD' method operates for both the 'Gain' and 'AcHf' calibration operations. An example using 'KEYBOARD' to calibrate directly against a Standard Cell is shown in the table below.

1.7.2 'KEYBOARD' with Negative Inputs

If the 'KEYBOARD' method is used on DC Voltage calibration with Negative polarity sources, it is important NOT to enter a negative sign with the keyed-in source value. The instrument itself can determine the polarity of the source and update the appropriate calibration memory location.

CALIBRATION EXAMPLE USING 'KEYBOARD'

Step	Calibration Operation	Calibration Source Setting	DVM Setting	'CALIBRATE' Key	DVM Reading After Calibration	Remarks
1	1V Range Zero	Short-circuit	DC,1	'Zero'	±.00000V	Short connecting leads at Standard Cell end
2	Connect Standard Cell	Standard Cell	KEYBOARD	–	0	
3	Enter Standard Cell Voltage	Standard Cell	1,·,0,1,8,1,6	–	+1.01816	
4	1V Range Calibration	Standard Cell	–	'Gain'	+1.01816	

1.8 'AUTOCAL' OVER THE BUS

All the calibration procedures covered in this manual can be carried out remotely using Option 50, the IEEE Bus.

Effectively, the five calibration keys are replaced by five Bus instructions and these are used instead of the 'CALIBRATE' keys listed in the Calibration tables on previous pages.

An example of calibration with the Bus is given in the table below. A complete program listing for the same calibration operation assuming an HP9825 controller is as follows:—

```
    dim D$[15]                 define 15 character string
                               variable
    clr 728                    send 'device clear' to DVM
                               (interface 7, address 28)
    wrt 728,"F3R3Q1W1="        program to DC 1V, SRQ
                               Mode 1, Enable Cal.
    0→S
    wrt 728,"G0="              program zero cal. trigger
 5: oni 7,"srq"                jump to SRQ service routine
                               on interrupt
 6: eir 7,128                  enable SRQ interrupts from
                               interface 7
 7: if bit ("01XXXXXX",S)      check status byte S
    =0;jmp −1                  obtained by service routine
 8: dsp "Apply 1V &            prompt operator to apply
    CONTINUE"                  calibration source on com-
                               pleting zero cal
 9: 0→S;stp
10: wrt 728,"G1="              program gain cal. trigger
11: oni 7,"srq"
12: eir 7,128
13: if bit ("01XXXXXX",S)
    =0;jmp −1
14: wrt 728,"T0W0="            program to Internal Trigger,
                               Disable Cal. on completion
                               of gain cal.
15: lcl 728                    program DVM to local state
16: stp
17: "srq":rds(728)→S           SRQ service routine to read
                               status byte
18: red 728,D$
19: iret
*7717
```

CALIBRATION EXAMPLE USING THE BUS

Step	Calibration Operation	Calibration Source	DVM Setting	Bus Controller Instruction	DVM Reading After Calibration	Remarks
1	Set DVM to known state	—	In Remote State	'Device Clear'	—	Program DVM to predetermined state A0C0DXE0F3M0N0 O0P0Q0R6S0T5
2	Set DVM to DCV, 1V Range, and prepare for calibration	+0.00000V	Calibration key to 'CAL'	'F3R3Q1W1='	—	Program DVM to Function: DC V (F3) Range: 1V (R3) SRQ Mode 1 (Q1) Enable Cal. (W1)
3	1V Range Zero	+0.00000V	In Remote State	'G0='	±.00000V	Program 'Zero' cal., SRQ indicates when calibration operation completed
4	1V Positive Full Range	+1.00000V	In Remote State	'G1='	+1.00000V	Program 'Gain' cal., SRQ indicates when calibration operation completed
5	Set DVM to Internal Trigger, Disable Cal.	—	In Remote State	'T0W0='	—	Program DVM to Internal Trigger (T0), Disable Cal. (W0)
6	—	—	In Local State, Calibration key to 'RUN'	'Local'	—	DVM in normal mode, free-running

SECTION 2

MECHANICAL DESCRIPTION

2.1 GENERAL

The 1061 has been designed to be either rack mounted in a standard 19″ rack (3½″ (2U) height required) or bench top/portable with integral tilt stand. An exploded view of the instrument is shown in Fig 2.1.

2.2 FRONT PANEL

The front panel incorporates the signal input terminals, range, function, mode, keyboard, compute and power switches and a numeric/legend gas discharge display.

2.3 REAR PANEL

The rear panel incorporates the mains supply, power input socket and fuses, digital and analog output sockets, rear and ratio signal input sockets, rear/front panel signal input selection switch, run/calibrate keyswitch, calibration interval (error) select switch and current option fuse.

2.4 EXTERNAL CONSTRUCTION

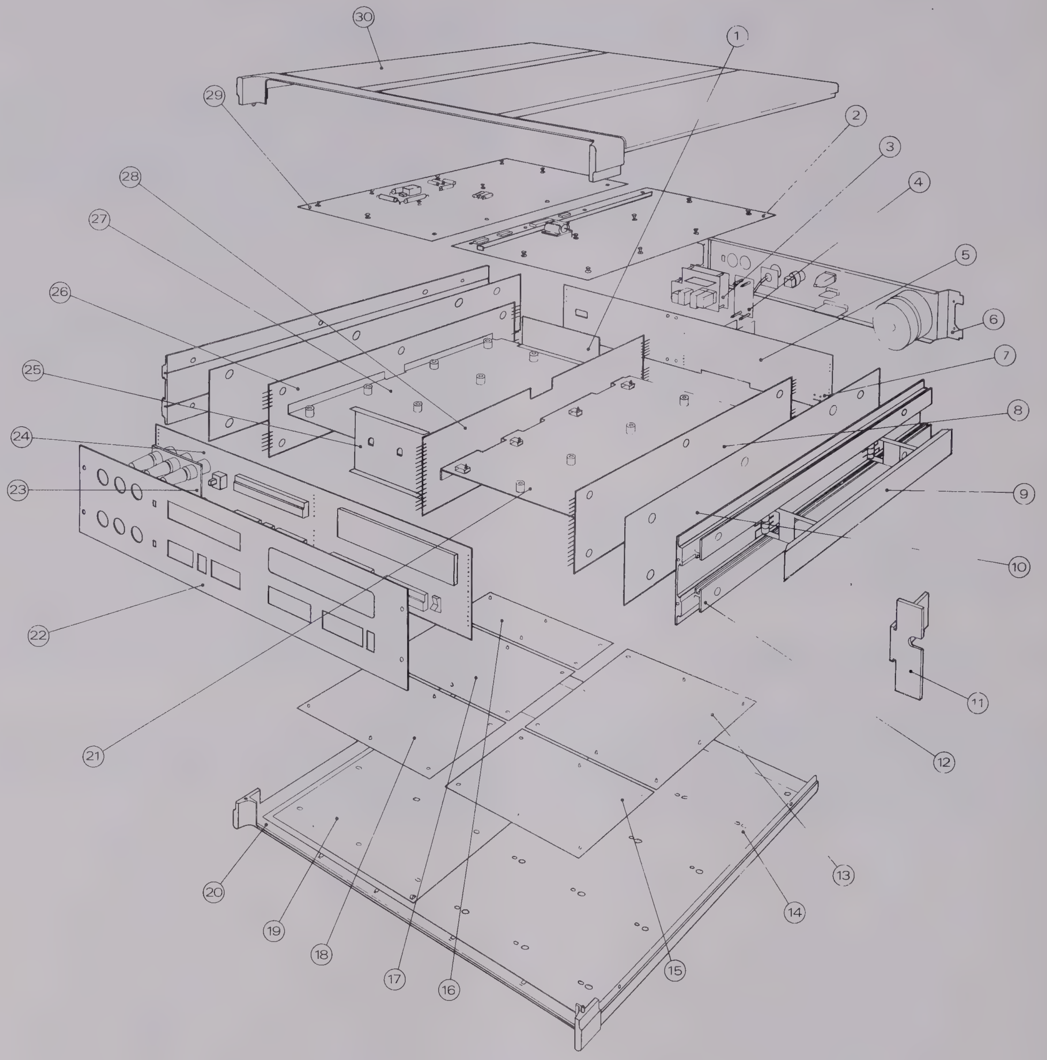
A screen printed key designation overlay adheres to the front panel retaining the polarising filter in front of the display. Both the front and rear panels are held together by two side extrusions running from front to rear. These side extrusions provide both slots for the handles or rack mounting 'ears' and locating points for the structural foam covers. The bottom cover is fitted with the tilt-stand, rubber feet and instruction card. Earth screening of the covers and guarding is provided by aluminium plates, heat-staked to the inside of the covers with electrical connections made by spring contacts.

2.5 INTERNAL CONSTRUCTION

An internal chassis is constructed from five printed circuit boards, held together by connectors at each corner and held rigid by two inner aluminium shields fixed horizontally on the instrument's centre line running from front to rear. Input terminals, switches and display are mounted on the front printed circuit board (pcb) and the power supply on the rear pcb. The two side and centre pcb's are used for interconnections between the main circuit boards.

All the main circuit boards are mounted on the inner shields with hinges and quick release fasteners with flexible connections to allow operation in the 'hinged-up' position. The Analog output circuitry is fixed on to the rear pcb of the chassis and the Ratio/Rear Input circuitry on to the rear panel. The options are mechanically fitted and require no soldering.

The chassis is mounted on to the side extrusions with nylon screws, spacers and an insulation sheet to ensure that the 'electrical spacings' of the BSI, UL and VDE specifications are achieved.



1. REAR GUARD SCREEN
2. DIGITAL ASSEMBLY
3. RATIO/REAR INPUT ASSEMBLY (OPTION)
4. ANALOG OUTPUT ASSEMBLY (OPTION)
5. REAR (POWER SUPPLY) PCB ASSEMBLY
6. REAR PANEL ASSEMBLY
7. POWER SUPPLY VOLTAGE SELECTION LINKS
8. R.H. PCB ASSEMBLY
9. HANDLE ASSEMBLY
10. INSULATION SHEET
11. RACK MOUNTING BRACKET
12. SIDE EXTRUSION
13. DIGITAL INTERFACE ASSEMBLY (OPTION)
14. EARTH SCREEN
15. DISPLAY DRIVER ASSEMBLY
16. CURRENT ASSEMBLY (OPTION)
17. AC ASSEMBLY (OPTION)
18. OHMS ASSEMBLY (OPTION)
19. OUTER GUARD SCREEN
20. BOTTOM COVER ASSEMBLY
21. R.H. CENTRE GUARD SCREEN
22. FRONT PANEL AND OVERLAY
23. TERMINAL SUPPORT PLATE
24. FRONT PCB ASSEMBLY
25. FRONT GUARD SCREEN
26. L.H. PCB ASSEMBLY
27. L.H. CENTRE GUARD SCREEN
28. CENTRE PCB ASSEMBLY
29. ANALOG ASSEMBLY
30. TOP COVER ASSEMBLY

FIG. 2.1 EXPLODED VIEW OF INSTRUMENT

SECTION 3

TECHNICAL DESCRIPTION

3.1 INTRODUCTION

The internal circuits of the basic DC only instrument are divided between five printed circuit board assemblies (shown in bold outline in Fig. 3.1).

For the purpose of explanation, each assembly will be described separately and each assembly further sub-divided according to the various functions involved.

3.2 ANALOG ASSEMBLY (Circuit Drawing No. 430328)

The Analog assembly is split into three distinct sections: (i) the Analog Interface, (ii) the DC Isolator and (iii) the Analog to Digital (A - D) Converter.

The Analog Interface receives data from the Digital assembly to control the selection, range scaling and other features of the analog circuitry. Messages between the Analog and Digital assemblies are passed via opto-isolators, electrically isolating one from the other.

The DC Isolator includes the preamplifier, range scaling circuits and bootstrapped supplies. The A - D section converts the scaled input signal to a time period proportional to the signal using a modified triple slope technique.

3.2.1 Analog Interface (430328 sheet 5)

3.2.1.1 Introduction

The Analog Interface provides electrical isolation between the Digital and Analog circuitry. Latched data from the microprocessor is passed through opto-isolators, decoded and latched again on an analog assembly to select function, range, test, average and the D - A converter set up conditions. A line is also provided to instruct the micro-processor which options are present and if the AC assembly is measuring a signal above 5kHz.

3.2.1.2 Power-On

At power-on the A - D converter is placed into the RESET condition (See Section 3.2.3.8). The analog circuitry is then interrogated to discern which options (if any) are fitted. Finally the analog circuitry is placed into the DC, 1000V range until a different range or function is selected (See Fig. 3.3).

To determine which options are fitted the Digital assembly sends a series of messages across the isolation barrier, decodes them on the analog side and gates them with lines from the option assemblies to feed a signal back across the isolation barrier to the micro-processor.

Looking at the procedure, in more detail, the Analog Interface Data (ID) lines are all set to a logic '1' except one, which is set to a logic '0', depending on the option being interrogated (See Fig. 3.2). As an example we will check to see if the AC option is fitted. ID1 is set low, the rest of the ID lines set high and the Analog Interface Address lines, IA0 and IA1 set low. The opto-isolators *invert* all signals, thus M17-3 is low and M19 pins 10, 4 and 11 are high. If the AC option is *not* fitted M19-2 is driven low via R55 from M17-3, causing M19-3 to be high, producing a logic '0' (—15 volts) on M18-4. If the AC option *is* fitted a 33kΩ resistor on the AC assembly (R14) overrides R55 and and a high is placed on M19-2. The effect is to produce a

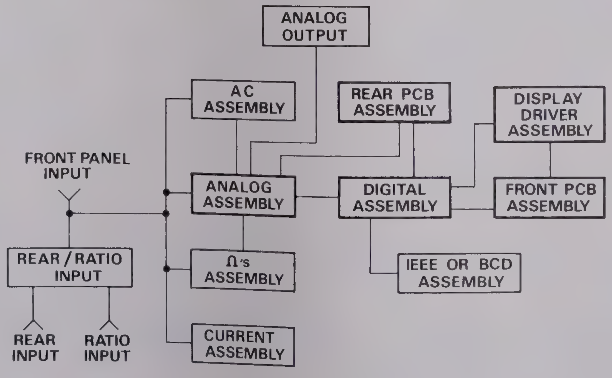


FIG. 3.1 PRINTED CIRCUIT BOARDS BLOCK DIAGRAM

Option checked	ID line low	Pin No. of M19 held low if Option incorporated
AC	ID 1	M19-3
Ω	ID 2	M19-11
I	ID 3	M19-4
RATIO	ID 4	M19-10

Fig. 3.2 POWER-ON OPTIONS FITTED TEST

high on M18-4, turning the opto-isolator M2-B on and thus COND. VAL (M2-8) is high, signalling to the Digital assembly that the AC option is fitted. Similarly, when the Ω, I or RATIO options are interrogated, the appropriate output of M19 is set low if the option is fitted causing the COND. VAL to be set high.

*Note: ID and IA lines
logic '1' ≡ +5 volts logic '0' ≡ 0 volts
AD lines
logic '1' ≡ 0 volts logic '0' ≡ –15 volts

The next step in the power-up sequence as far as the analog circuits are concerned, is to be placed into the DC, 1000V range (See Fig. 3.3 Flowchart). Firstly, all assemblies are deselected by placing logic '1's on all the ID lines, then setting the IA0 and IA1 lines low (see Fig. 3.4), clocking the option selects latches (M20 Analog assembly, M5 AC assembly, M9 Ohms assembly, M1 Ratio assembly from M17-3. Both IA lines then return high.

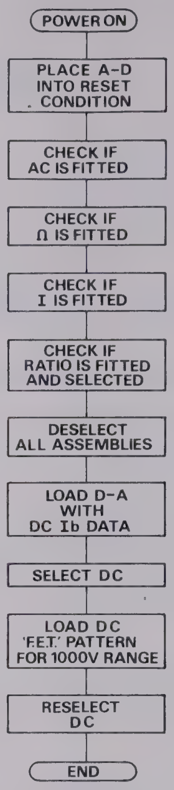

POWER ON
PLACE A–D INTO RESET CONDITION
CHECK IF AC IS FITTED
CHECK IF Ω IS FITTED
CHECK IF I IS FITTED
CHECK IF RATIO IS FITTED AND SELECTED
DESELECT ALL ASSEMBLIES
LOAD D–A WITH DC Ib DATA
SELECT DC
LOAD DC 'F.E.T.' PATTERN FOR 1000V RANGE
RESELECT DC
END

FIG. 3.3 ANALOG INTERFACE SEQUENCE: POWER-UP

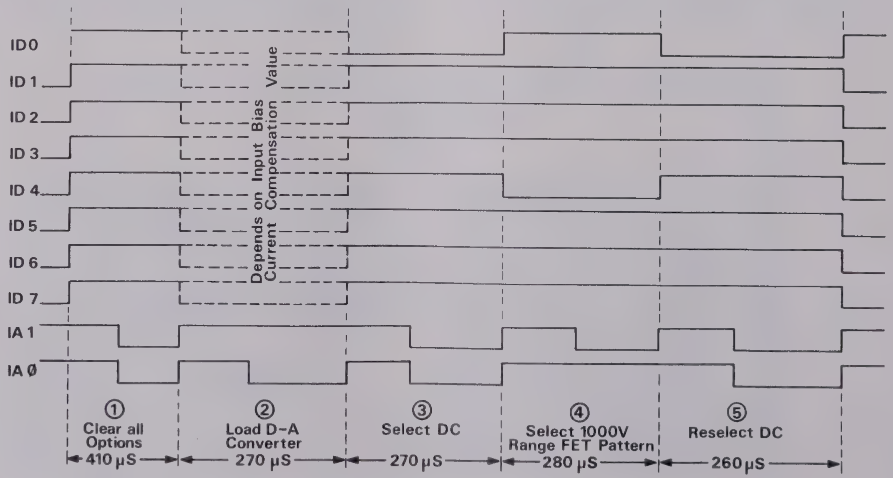

ID0
ID 1
ID 2
ID 3
ID 4
ID 5
ID 6
ID 7
IA 1
IA 0
Depends on Input Bias Value
Current Compensation
① Clear all Options
410 μS
② Load D–A Converter
270 μS
③ Select DC
270 μS
④ Select 1000V Range FET Pattern
280 μS
⑤ Reselect DC
260 μS

FIG. 3.4 ANALOG INTERFACE DATA LINE TIMING DIAGRAM (POWER-UP)

Secondly, the latches of the D - A converter (M13, M14) are set up with the input bias current (Ib) compensation data. The ID lines are set to the appropriate pattern and the information is clocked on to M13 and M14 by a delayed low to high edge from M17-4, originating from IA0 going low. The delay makes sure that the signal from M17-10 has disabled the "F.E.T." latch M21. Once again, the IA0 line returns to the resting state of logic '1'. Thirdly, the DC analog circuits are enabled by setting all the ID lines high except for ID0, then clocking M20 by a low to high edge from M16-6 caused by both IA lines going low. Once DC has been selected, the F.E.T. pattern latch is enabled from M12-1, and the penultimate step is to load this latch with 1000V range data from the ID lines (ID4 low, the rest high). This is executed by clocking the 'F.E.T.' latch from M17-4 once again, but this time being due to IA1 going low. The final step is to reselect DC as described above.

3.2.1.3 General Interface Update Sequence

Before the start of each reading, the analog interface undergoes a complete update. The series of events is the same as the power-up sequence for selection of function and range, as can be seen by comparing the two flowcharts (Figs. 3.3 and 3.5). When Ohms or Current is selected, the DC Isolator or AC assembly is also used in the measurement procedure as seen in the following table.

Type of Measurement	Circuits Selected	Use of D - A
DC Volts	Analog Assembly	Input Bias Current Compensation
AC Volts	AC Assembly	Frequency Compensation
AC + DC Volts	AC Assembly	Frequency Compensation
Resistance	Ohms Assembly and Analog Assembly	Input Bias Current Compensation
DC Current	Current Assembly and Analog Assembly	Input Bias Current Compensation
AC Current	Current Assembly and AC Assembly	Frequency Compensation
AC + DC Current	Current Assembly and AC Assembly	Frequency Compensation

The update sequence order is (i) Deselect all assemblies, (ii) Load D - A latches, (iii) Select AC assembly or DC isolator, (iv) Load range pattern into DC or AC range latches, (v) Deselect DC or AC and select either the Ohms or Current assembly, (vi) Load range pattern into Ω's or I range latches, (vii) Reselect circuits selected in (iii) and (iv).

Note: Steps (v) and (vi) are used only when I or Ω is selected.

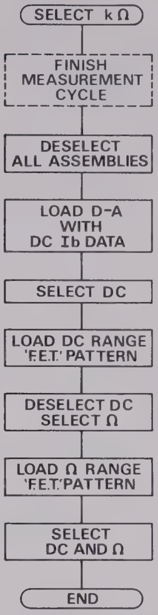


FIG. 3.5 ANALOG INTERFACE SEQUENCE: OHMS SELECT

Flowchart 3.5 gives the above sequence for an ohms update. The general form of the timing diagram for the above sequence is given in Fig. 3.6, the analog 'F.E.T.' patterns for each range of each function being given in Appendix 1.

3.2.1.4 Test

When TEST is selected, a logic '0' is placed on ID7 at stages (iii), (v) and (vii) in Fig. 3.6, i.e. each time a function measurement circuit is selected. Appendix 1 lists the 'F.E.T.' patterns of each assembly for each test measurement cycle.

3.2.2 DC Isolator Section

3.2.2.1 Preamplifier Scaling (430328 sheet 1)

Figure 3.8 shows the essential features of the isolator scaling circuit. For the purpose of explanation the same symbols are used, regardless of whether the switching is accomplished electronically (F.E.T.) or by means of relay contacts. In Fig. 3.8 all switches are shown in the 1V RANGE position.

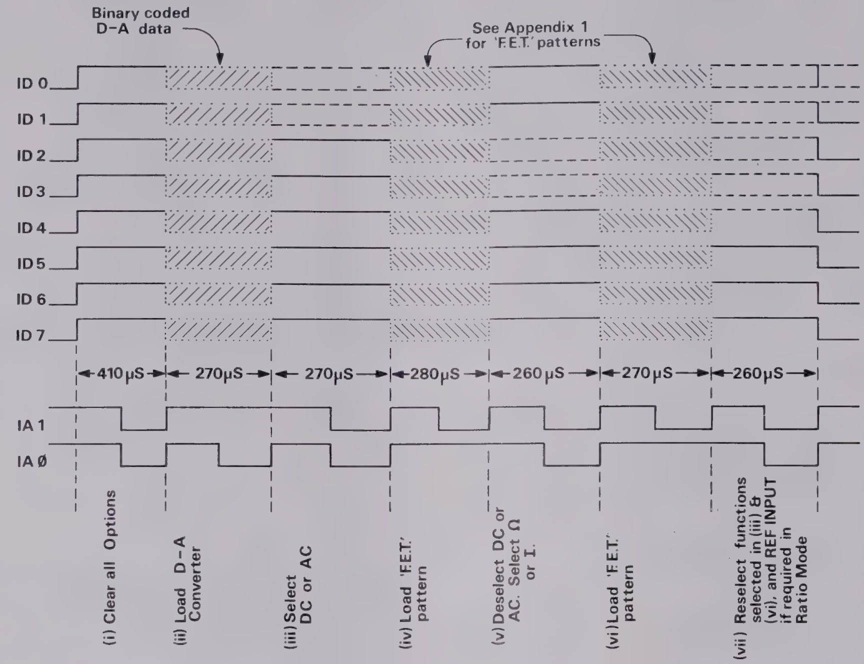

Binary coded D-A data
See Appendix 1 for 'F.E.T.' patterns
ID 0
ID 1
ID 2
ID 3
ID 4
ID 5
ID 6
ID 7
410μS
270μS
270μS
280μS
260μS
270μS
260μS
IA 1
IA Ø
(i) Clear all Options
(ii) Load D-A Converter
(iii) Select DC or AC
(iv) Load 'F.E.T.' pattern
(v) Deselect DC or AC. Select Ω or I.
(vi) Load 'F.E.T.' pattern
(vii) Reselect functions selected in (iii) & (vi), and REF INPUT if required in Ratio Mode

FIG. 3.6 GENERAL FORM OF ANALOG INTERFACE UPDATE TIMING DIAGRAM

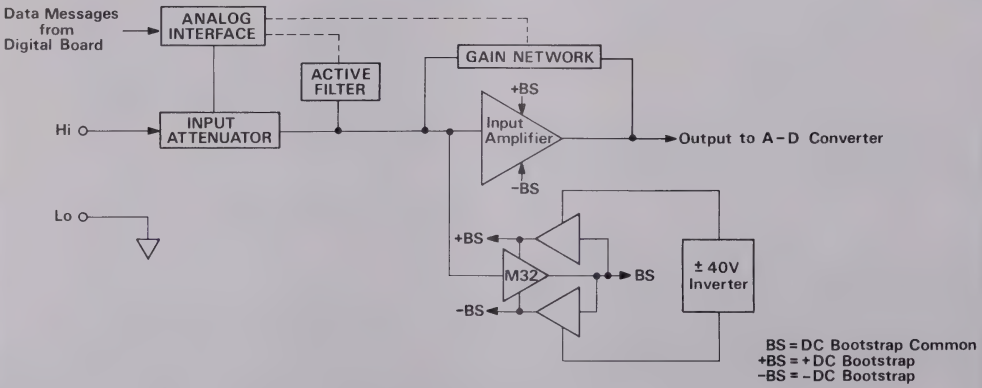

Data Messages from Digital Board
ANALOG INTERFACE
ACTIVE FILTER
GAIN NETWORK
+BS
Input Amplifier
-BS
Output to A-D Converter
Hi
INPUT ATTENUATOR
Lo
+BS
M32
BS
-BS
± 40V Inverter
BS = DC Bootstrap Common
+BS = + DC Bootstrap
-BS = - DC Bootstrap

FIG. 3.7 SIMPLIFIED DIAGRAM OF DC ISOLATOR

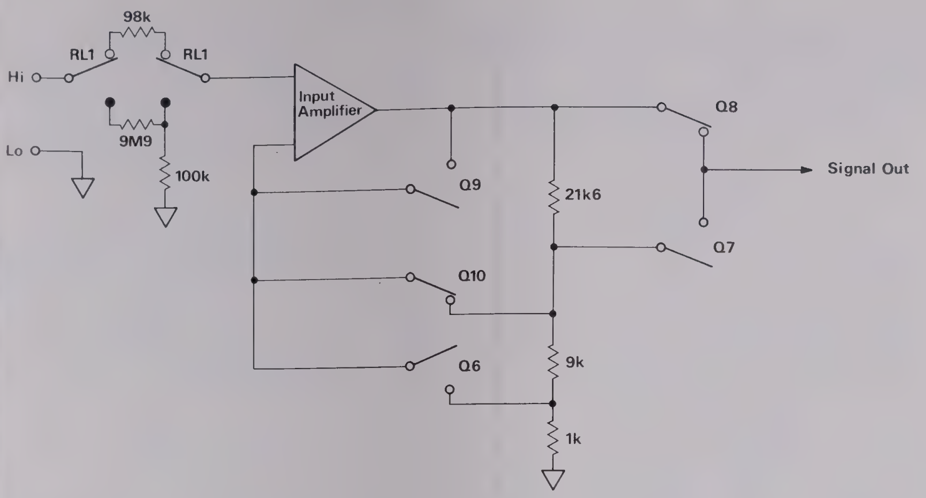


FIG. 3.8 SIMPLIFIED DIAGRAM OF ISOLATOR SWITCHING

The various switching combinations for the different ranges are as follows:—

Range	Gain	Q6	Q7	Q8	Q9	Q10	RL1
00mV	x31.6	ON	OFF	ON	OFF	OFF	ON
V	x3.16	OFF	OFF	ON	OFF	ON	ON
0V	÷3.16	OFF	ON	OFF	ON	OFF	ON
00V	÷31.6	OFF	OFF	ON	OFF	ON	OFF
000V	÷316	OFF	ON	OFF	ON	OFF	OFF
$\overline{C}$		OFF	OFF	OFF	ON	OFF	OFF

The configuration of the circuit for each range is shown in Fig. 3.9.

Reference should be made to circuit diagram number 430328, sheet 1, for the complete circuit. Sheet 2 gives tables of the coding on the input control lines (from the Analog Interface).

When the 100V or 1kV range is selected, a ÷100, 10MΩ input attenuator (R143, R156, R149, R148) is incorporated into the circuit. This is a matched set of resistors for low temperature coefficient. The selection of a lower range energizes relay RL1 (via Q33), causing resistor chain R119-R122 to be in series with the Hi input. Should an overload signal then be applied, the resistor chain limits the current and the power dissipation is such that 1000V can be applied continuously.

The amplifier end of the resistors is clamped by zener diodes D22, D23 and Q18, Q19 to low, thus the amplifier input can never exceed approximately ± 24 volts.

The output from the DC Isolator, test point (TP13) is approximately 3.16 volts ($\approx\sqrt{10}$) for a full range (100,000) input by the following methods (See Fig. 3.9):—

100mV Range	Q6 and Q8 are turned on; all other F.E.T.'s are turned off and RL1 energised. Thus the output of the amplifier is connected to its inverting input via R108, R109, R110, R111 and Q6, an attenuator chain of ÷31.6, giving the amplifier an overall gain of X 31.6 Q8 connects the preamplifier directly to the output.
1V Range	Q10 and Q8 are turned on, all other F.E.T.'s are turned off and RL1 energised. The output of the amplifier is connected to its inverting input via R108, R109, R110, R111 and Q10, an attenuator chain of ÷3.16, giving the amplifier an overall gain of X 3.16. Q8 connects the preamplifier directly to the output.
10 V Range	Q9 and Q7 are turned on; all other F.E.T.'s are turned off and RL1 energised. Q9 causes the amplifier output to be directly connected to its inverting input, giving a gain of unity. The output of the amplifier is attenuated by 3.16 (R114, R115) before being passed to the output via Q7 instead of Q8.
100V and 1000V Ranges	These two ranges select the 1V and 10V ranges respectively but a ÷100 attenuator (R149, R156, R143, R148) is inserted between Hi and the preamplifier input when RL1 is de-energised.

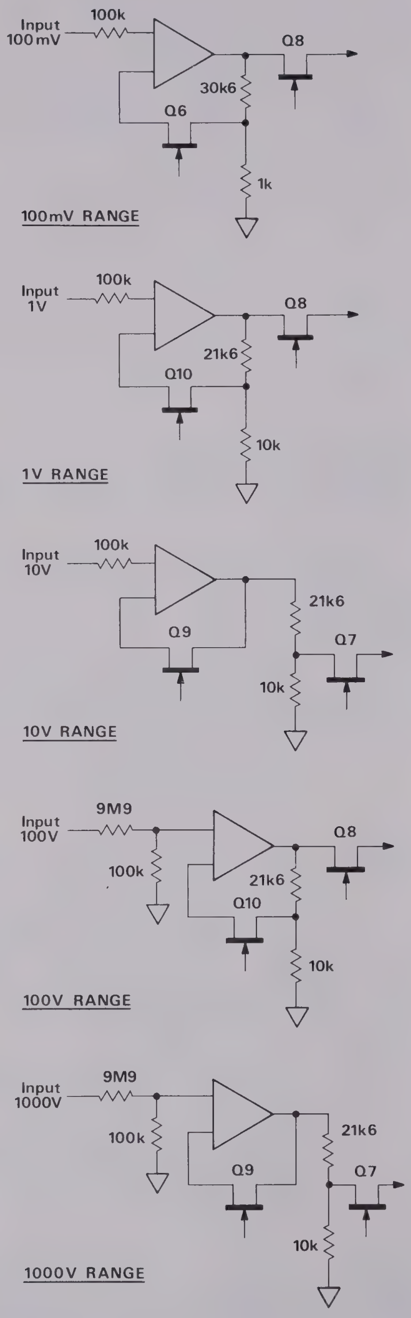


FIG. 3.9 PREAMPLIFIER GAIN CIRCUITS

3.2.2.2 Preamplifier (430328 sheet 1)

The preamplifier is designed to present an input impedance of greater than 10,000MΩ for signals up to ± 20 volts. It is also bootstrapped (tracking of both ground lines and supply voltages with input signal) being essential for correct operation of input bias compensation, temperature compensation and common mode rejection.

Q12 is a well matched monolithic NPN transistor pair exhibiting minimal voltage drift and low noise characteristics, the output being buffered by M31. To compensate for the current gain drift of Q12 (approx. –1%/°C), the change in the base-emitter voltage of one half of Q12 is sensed by M30. The drift compensation is linearised to 1%/°C by thermistor R218. Thus the input bias current is kept constant with temperature.

3.2.2.3 D.C. Bootstrap (430328 sheet 2)

Bootstrapped supplies are generated which track the input signal directly (BS), track the input signal with a positive offset of +12V(+BS) and track the input signal with a negative offset of –12(–BS).

M32 is the high inpedance buffer which tracks the inverting input of the preamplifier. The offset of M32 is adjusted so that its input is within 100µV of the input of the preamplifier. M32 thus functions as the low impedance rail (BS) following the input signal.

Selection of DC(M20-3) enables the capacitive inverter driven from M33 to provide an unregulated +42V(TL4) and –42V(TL5) supply from the ±15V supply.

The positive bootstrap supply (+BS) is generated as a current source comprising Q26 and the shunt regulator, Q27, referenced to D50. When the output voltage of the regulator is approximately 1.2 volts above D50 cathode, Q27 conducts current into R175. Since the current in R175 is controlled to be constant by Q30, referenced to D50, the curremt flowing through R174 is reduced. Hence the supply current, "mirrored" in R173, is reduced and the output voltage controlled.

The negative bootstrap supply (–BS) is generated in a similar manner. Thus bootstrapped supplies of approximately ±12 volts are produced, tracking the input signal exactly.

3.2.2.4 Filtering (430328 sheet 1)

Selection of filter causes an active filter to be switched in by relay, R12, (via Q32). The filter gives an attenuation of –34 dB at 50Hz. The essential components of the filter are shown in Fig. 3.10.

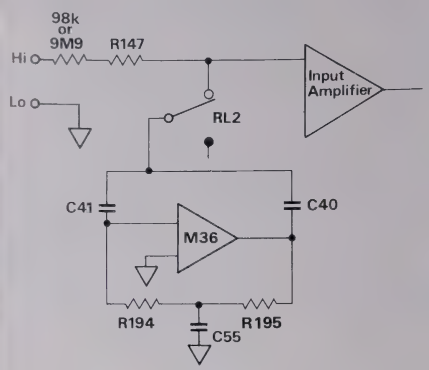


FIG. 3.10 SIMPLIFIED DC ISOLATOR FILTERING CIRCUIT

3.2.2.5 Input Current (Ib) Compensation (430328 sheets 1 and 5)

During the calibration cycle, the microprocessor notes and stores the zero error due to the bias current (measured in a known source resistor). When DC is selected, this information is recalled by the microprocessor, transferred across the isolation barrier and latched into M13 and M14, see Fig. 3.11.

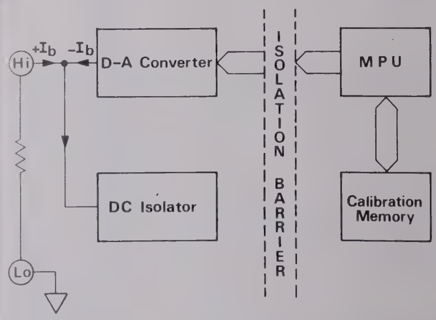


FIG. 3.11 SIMPLIFIED DIAGRAM OF BIAS CURRENT COMPENSATION

The output from the latches is applied to the binary resistor ladder network, AN2, providing a 255 step digital to analog conversion. The analog signal is applied to the inverting input of M3 so that the output drives current, through the diode, to control the current in the corresponding transistor of the opto-isolator, M23. The transistor of the opto-isolator sinks current to the −15V supply until the voltage across R198 is equal to the voltage applied to the inverting input of M3.

The other half of the opto-isolator acts as a current mirror, referenced to the bootstrap (BS) supply. Thus the input current correction is floated on the bootstrap supply, tracking the input signal is divided by R84 to R128 and R129 to null the bias current of the preamplifier.

3.2.2.6 Test (430328 sheets 1 and 5)

During the self-test routine, (actuated from the front panel or remotely programmed) the DC isolator is checked for correct operation. The circuitry is placed into the 0.1V range, as described in 3.2.1.3, except that relay RL1 is not energized, (i.e. the ÷ 100 attenuator is across the input amplifier). Filter is selected and F.E.T. Q5 'closed' via M20-5 causing a small signal to be injected into the feedback path of the input amplifier. Thus a signal of −3.125 volts is output from the DC Isolator (TP13). This signal is then measured and compared with a stored value. If the measured signal is within ±6% of the stored value, the test continues with a 1V range check and a 10V range check.

Range	Output signal from DC Isolator (TP13)
0.1V	− 3.125 volts
1V	− 0.2193 volts
10V	− 0.06932 volts

DC Isolator Output Test Voltages

3.2.3 Analog to Digital Conversion (Analog Section) (430328 sheets 3 and 4)

3.2.3.1 General Principles

Section 3.2.4 and Fig. 3.2 of the User's Handbook gives a very basic description of the principles of the integration involved. The technique used in the Autocal Voltmeter is a quadruple slope, the two extra slopes being towards the end of the signal and reference integration periods respectively.

Fig. 3.12 is a simplified diagram showing the essentials of the analog section of the A - D conversion and should be used with timing diagram Fig. 3.13 for full appreciation of the circuit operation.

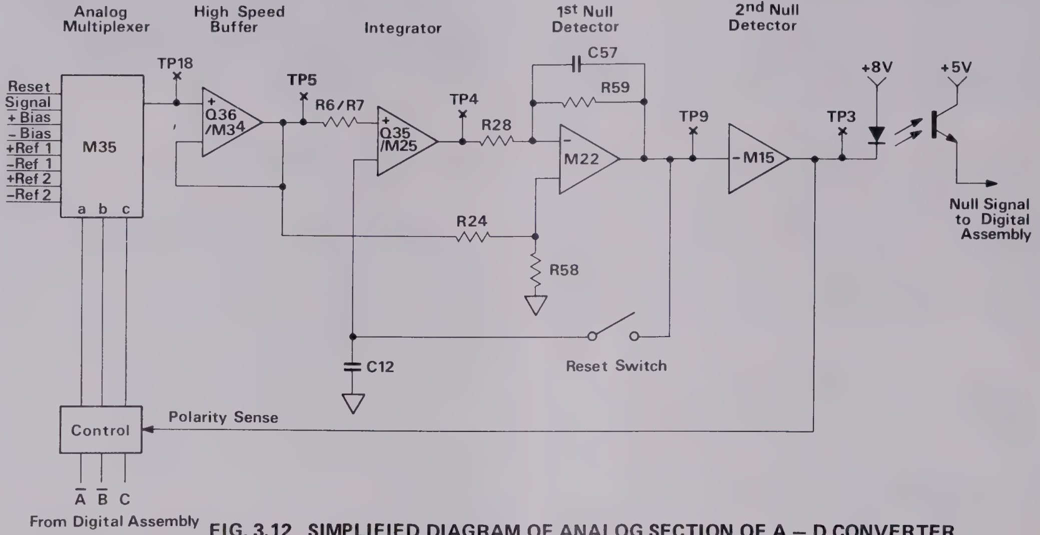

Analog Multiplexer
High Speed Buffer
Integrator
1st Null Detector
2nd Null Detector
Reset
Signal
+ Bias
– Bias
+Ref 1
–Ref 1
+Ref 2
–Ref 2
M35
a b c
TP18
Q36 /M34
TP5
R6/R7
Q35 /M25
TP4
R28
C57
R59
M22
TP9
M15
TP3
+8V
+5V
Null Signal to Digital Assembly
R24
R58
C12
Reset Switch
Control
Polarity Sense
$\overline{A}$ $\overline{B}$ C
From Digital Assembly

FIG. 3.12 SIMPLIFIED DIAGRAM OF ANALOG SECTION OF A – D CONVERTER

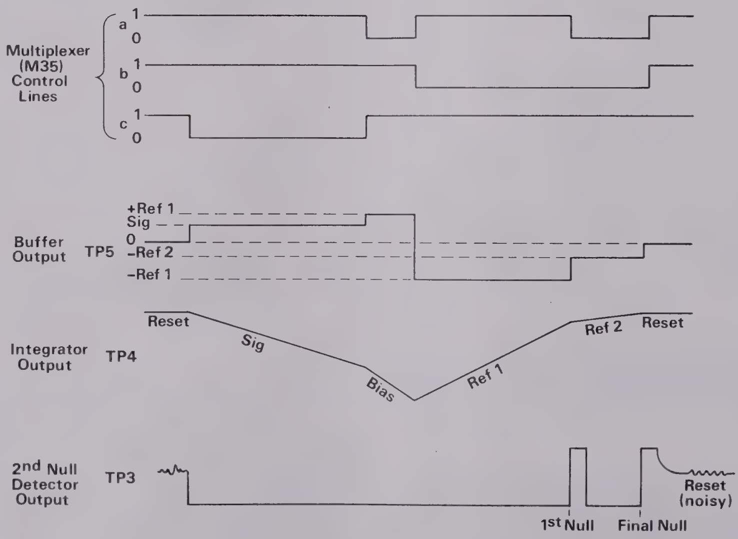

Multiplexer (M35) Control Lines
a 1 0
b 1 0
c 1 0
Buffer Output
TP5
+Ref 1
Sig
0
–Ref 2
–Ref 1
Integrator Output
TP4
Reset
Sig
Bias
Ref 1
Ref 2
Reset
2nd Null Detector Output
TP3
1st Null
Final Null
Reset (noisy)

FIG. 3.13 TIMING DIAGRAM FOR ANALOG SECTION OF A – D CONVERTER
(Positive Signal)

3.2.3.2 A - D Input Control

The analog signal from the DC Isolator is applied to the analog multiplexer (M35) and fed to the input of the buffer (Q36/M34). This in turn feeds the signal to the integrator comprising of Q35, M25 and C9.

Control of the multiplexer is derived from the Digital assembly via opto-isolators M4, M5 and M6. These signals control the sequence of events, allowing first the signal, then a bias voltage of the same polarity as the signal, followed by opposite polarity reference and reference ÷16 signals to the buffer and integrator. The multiplexer is then placed in a reset condition ready for the next measurement cycle. Fig. 3.14 gives the multiplexer control line sequence for both positive and negative signals.

STATE	a	b	c	STATE	a	b	c
RESET	1	1	1	RESET	1	1	1
SIG	1	1	0	SIG	1	1	0
+ BIAS	0	1	1	−BIAS	0	1	0
−REF 1	1	0	1	+REF 1	1	0	0
−REF 2	0	0	1	+REF 2	0	0	0
RESET	1	1	1	RESET	1	1	1

Positive signal   Negative signal

Logic levels : (0 ≡ −8V, 1 ≡ +8V)

Fig 3.14 MULTIPLEXER CONTROL LINE SIGNALS

3.2.3.3 Reference Voltages and Control Logic Power Supply

REF 1 : The two halves of M39 in conjunction with zener diodes D60 and D59 form the positive and negative reference voltages respectively, D65 and D64 being 'start-up' diodes (see Fig. 3.15). The outputs of M39 (+11 and −11 volts) supply the defined current for the reference zeners via R212 and R38 respectively. R19 and R18 are selected by Datron so that each zener has zero voltage/temperature coefficient.

The resistor chains R41-R43 and R88-R90 are binary weighted values allowing the set up of the exact nominal REF 1 voltages, of ±6.42V, by cutting the appropriate links.

REF 2 : The second reference is 1/16th of REF 1. The positive and negative REF 1 voltages are divided by R71, R68 and R214, R70 respectively.

The power supplies for the logic circuits M35, M29, M27, M28 and opto-isolators M1, M4, M5 and M6 are also derived from M39 via zener diodes D61 and D62, giving supply voltages of ±8 volts.

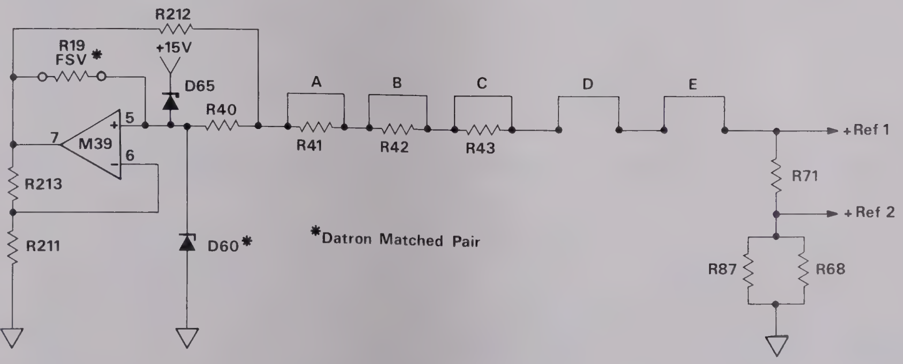


FIG. 3.15 POSITIVE REFERENCE CIRCUITRY

3.2.3.4 High Speed Buffer

C22 slows the switching edges from the multiplexer M35 so that the buffer cannot slew-limit and thus lose the charge. The signals are fed to Q36, M34 which comprise a high speed buffer with high common mode rejection ratio (See Fig. 3.16). The common mode rejection is dependent on the power supplies of Q36 (from R66 and R11-R15) being bootstrapped to the output of the buffer, via D2 and D4. Thus the difference between input signal and power supply around the input stage is maintained constant whatever the input signal.

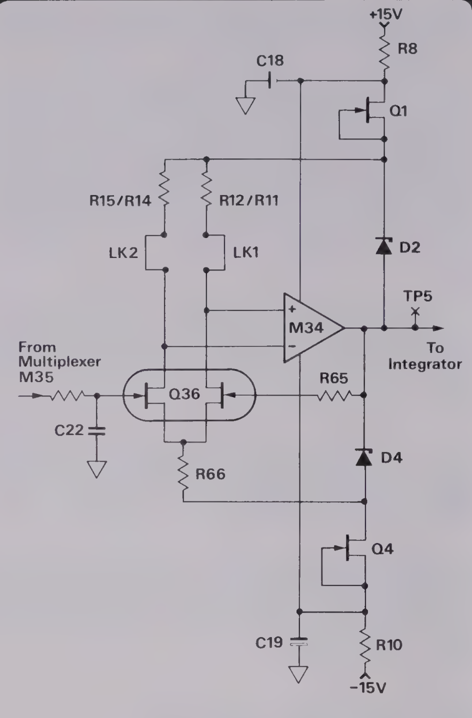

+15V
R8
C18
Q1
R15/R14
R12/R11
LK2
LK1
D2
TP5
M34
From Multiplexer M35
To Integrator
Q36
R65
C22
D4
R66
Q4
C19
R10
−15V

FIG. 3.16 HIGH SPEED BUFFER CIRCUITRY

3.2.3.5 Integrator

The Integrator basically comprises an amplifier made up from Q35 and M25 with a charge storing capacitor C9 (See Fig. 3.17). The low gate leakage F.E.T. pair, Q35, boosts the gain of the integrator such that it is great enough to guarantee no non-linearity errors due to finite gain.

R4, C10 driven by an attenuated and inverted version of the integrator-output waveform, via R26 and R5, form a circuit to compensate for the small amount of dielectric absorption present in C9.

C11, R23 and R27 provide similar compensation but in this case the time constant is such that it effects the linearity, with R23 set to correct linearity at 1/10th of full range.

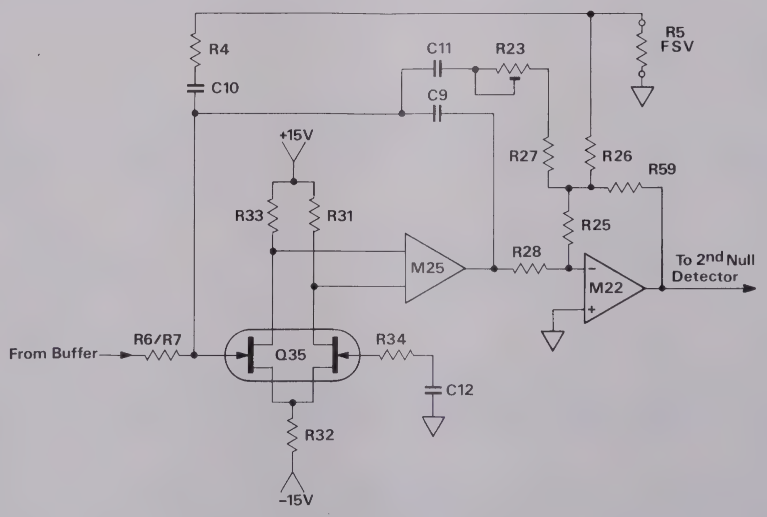

R4
C10
C11
R23
R5
FSV
C9
+15V
R27
R26
R59
R33
R31
R25
R28
M25
M22
To 2nd Null Detector
From Buffer
R6/R7
Q35
R34
C12
R32
−15V

FIG. 3.17 INTEGRATOR CIRCUIT

3.2.3.6 1st Null Detector

The 1st null detector comprises a low noise amplifier, M22, an inverting configuration, where the dc gain is controlled by the ratio of R59 to R28 for small inputs. For larger inputs from the integrator the clamp diodes, D1 and D3, prevent the amplifier from saturating.

During REF 1 the non-inverting input is offset by approximately 10mV to determine the point at which REF 2 is applied (after counting is synchronised). In REF 2 the offset reduces by a factor of 16 giving the null reference point.

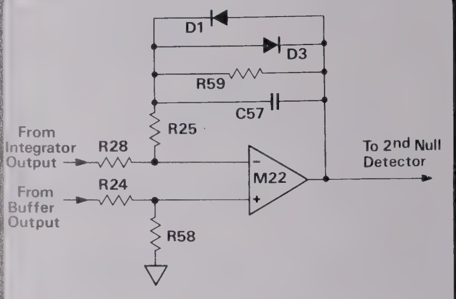

D1
D3
R59
C57
R25
From Integrator Output
R28
From Buffer Output
R24
M22
-
+
To 2nd Null Detector
R58

FIG. 3.18 1st NULL DETECTOR CIRCUITRY

3.2.3.7 2nd Null Detector

The signal from the 1st null detector is applied to M15 which boosts the voltage gain. The output provides a logic drive signal via opto-isolator M1, signalling the digital circuitry whenever a null condition changes, Fig. 3.19.

When in an averaging mode (Input Zero or CAL ZERO selected) the 2nd null detector is offset a small amount in a cycle of 16 steps. (See Fig. 3.20). This offset is produced from the digital to analog converter, M28, which is clocked from M6, the C control opto-isolator and enabled by the level shifted $\overline{\text{AVE}}$ signal.

3.2.3.8 Reset Period

At the end of a measurement cycle or in hold, the circuitry is placed into a reset condition. The control lines of the multiplexer M35 allows the 0 volts reference input, at pin 4, to be connected to its output. (See Fig. 3.21). At the same time the reset line (M27-3) is taken high turning on M26. This reset signal, applied to pins 5 and 12 of M26, allows the output of the 1st null detector to be fed back via R60 to a sample and hold capacitor C12 on the integrator.

Thus, with the input to the A - D converter at zero volts, the charge stored on C12 is the sum of all the offsets from the multiplexer, buffer, integrator and 1st null detector, allowing the 1st null detector to indicate the true zero crossing (null) point.

The reset signal applied to M26 pins 6 and 13 merely allows a lower impedance path between the buffer and the integrator to speed up the settling time as C9 is discharged to zero.

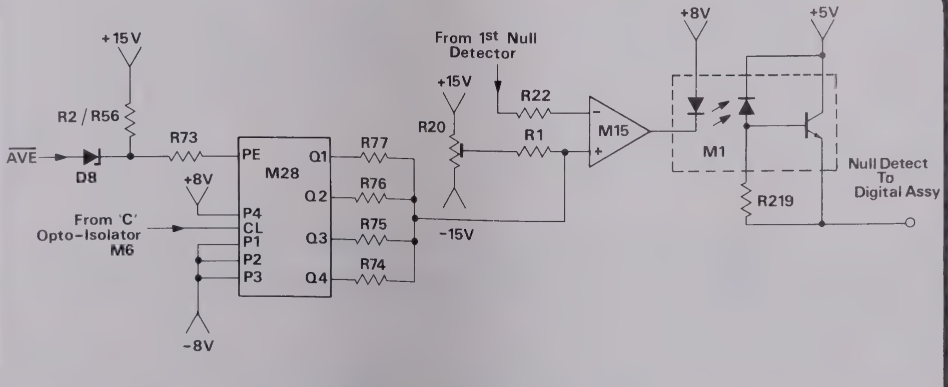

+15V
R2 / R56
AVE
D8
R73
+8V
From 'C' Opto-Isolator M6
-8V
PE
M28
P4
CL
P1
P2
P3
Q1
Q2
Q3
Q4
R77
R76
R75
R74
R20
+15V
-15V
From 1st Null Detector
R22
R1
M15
-
+
+8V
+5V
M1
R219
Null Detect To Digital Assy

FIG. 3.19 2nd NULL DETECTOR CIRCUITRY

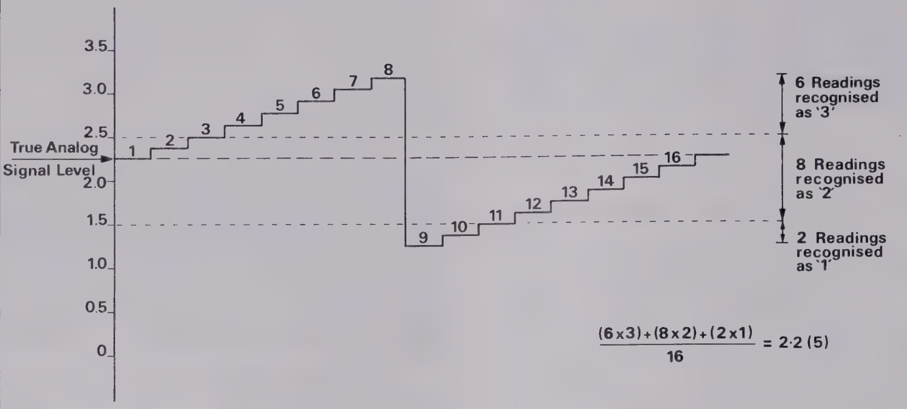


FIG. 3.20 DIAGRAM OF AVERAGING PROCESS

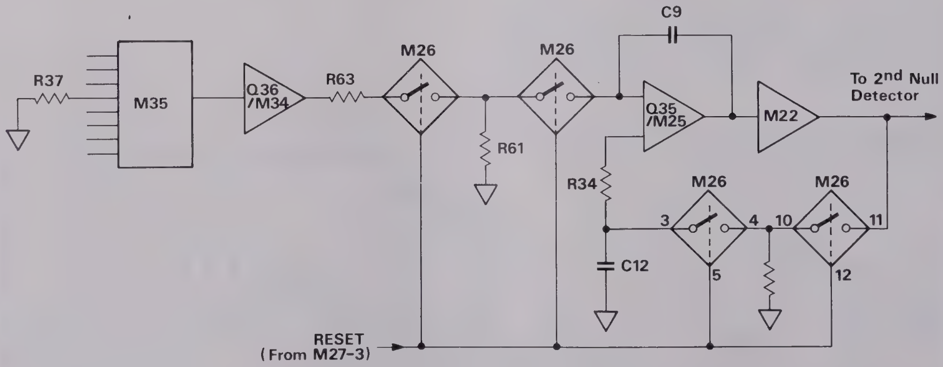

R37
M35
Q36 /M34
R63
M26
M26
R61
C9
Q35 /M25
M22
To 2nd Null Detector
R34
M26
M26
3
4
10
11
5
12
C12
RESET (From M27-3)

FIG. 3.21 SIMPLIFIED DIAGRAM OF A – D DURING RESET PERIOD

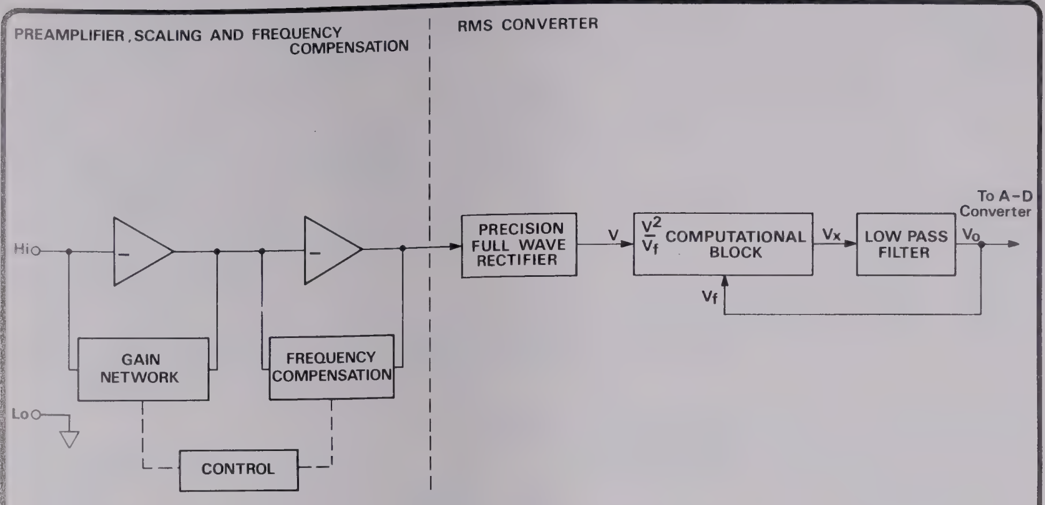


FIG. 3.22 SIMPLIFIED DIAGRAM OF AC CONVERTER

3.3 AC ASSEMBLY (Circuit Drawing No. 430402)

3.3.1 General Principles

The preamplifier buffers and ranges the signal in order to present 0.9 volts full range to the AC to DC converter section.

Once converted to an equivalent DC signal, it is applied to the analog to digital converter on the main analog assembly.

The conversion technique is electronic true RMS sensing as shown in the simplified block diagram Fig. 3.22. The Datron RMS module can be best considered as a functional block consisting of circuitry which accepts two inputs, V and V_f, computes V^2/V_f and has an output of V_x which is then filtered so that all the AC components are removed. The output of the block is fed back to V_f, thus closing the loop around the whole circuitry.

Mathematically: $\overline{V_x} = V_o$

but $V_x = V^2/V_f$

$$\overline{V^2}/V_f = V_o, \text{ but } V_o = V_f$$

$$\overline{V^2} = V_o^2$$

i.e. $\underline{V_o = \sqrt{\overline{V^2}}}$

3.3.2 Preamplifier and Scaling (430402 sheet 1)

Relay RL2 is energised on selection of AC, directly connecting the Hi terminal to the input of the AC assembly. If DC and AC are selected together, the AC assembly becomes DC coupled by energising RL3, causing C57, the AC coupling capacitor, to be by-passed.

The signal is then fed to the switched gain inverting preamplifier whose full range output is 0.9 volts r.m.s. A simplified diagram of this arrangement is shown in Fig. 3.23. The frequency response is held flat, to within ±1%, by controlling the gain defining component time constants, to a similar order of accuracy. Residual errors are removed by the frequency compensation stage. (See section 3.3.4).

The preamplifier has a stable DC path provided by a dual transistor pair Q33 and a fast AC path by dual F.E.T.'s Q32 and Q34. Further gain is provided by the following long-tail pair cascade of Q20, Q21, Q22 and Q23, which is loaded by a current mirror, Q24. Q15 and Q16 with bias components Q17 and Q18 form a conventional class AB output stage. R121 compensates for the bias current of Q33, whileR112 trims the offset voltage to zero.

The unity gain frequency compensation amplifier consists of a stable DC path, provide by M11, and a fast AC path provide by Q25 to Q29. The bootstrap circuit of Q19 presents the varicap diode, D11, with a high impedance, thus ensuring that the varicap is not shunted to ground.

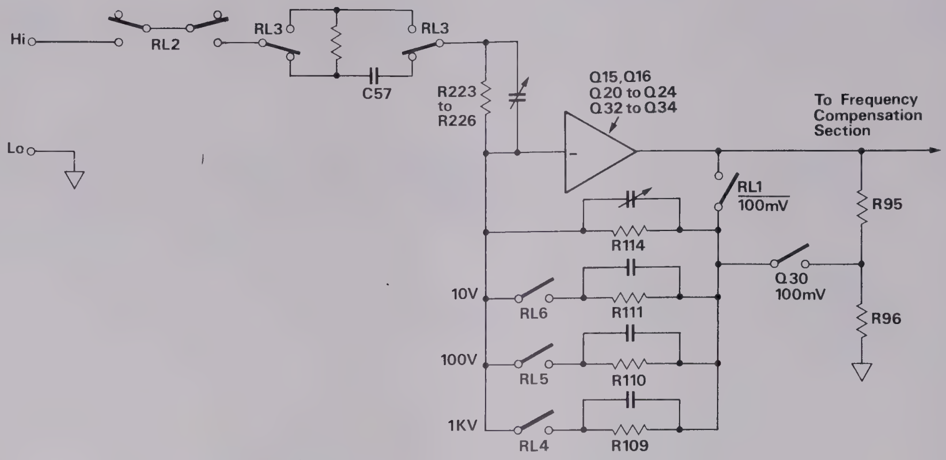

Hi
RL2
RL3
RL3
C57
R223
to
R226
Lo
Q15,Q16
Q20 to Q24
Q32 to Q34
To Frequency
Compensation
Section
RL1
100mV
R95
R114
Q30
100mV
R96
10V
RL6
R111
100V
RL5
R110
1KV
RL4
R109

FIG. 3.23 SIMPLIFIED DIAGRAM OF THE AC PREAMPLIFIER SCALING

3.3.3 RMS Converter (430402 sheet 2)

The RMS converter takes the scaled AC signal from the preamplifier and converts it to an equivalent DC signal suitable for Analog-to-Digital conversion. The conversion technique is electronic true RMS sensing as shown in the simplified block diagram Fig. 3.25.

M8 and M9 form a summing type, full wave rectifier. The output of M8, a precision half-wave rectifier inverter, is summed with the non-inverted signal with a weighting of 2 : 1 at the input of M9. This forces a full-wave rectified current to flow in RMS module M6. Potentiometer R50 balances the rectifier to provide the same output for non-inverted or inverted asymmetric waveforms.

The output current from the RMS module passes into filter-buffer M1 and is converted to a nominal 5 volt for a full range signal. Q1 and Q2 switch in additional capacitors when FILTER is selected, to operate down to 45Hz. M2 is a voltage to current converter providing a feedback current to the RMS module proportional to the output voltage. R90 is the zero adjustment for the half wave rectifier M8 and R35 is the high crest factor gain adjustment. R75 is adjusted for optimum linearity.

The output of M1 (TP2) is fed to a resistor chain R1 - R7, to provide an output of 3.14 volts by the selection of resistors R2 - R5. Q3 is turned on when AC is selected and switches the output of the AC converter into the Analog-to-Digital Converter (Drawing No. 430328 sheets 3 and 4).

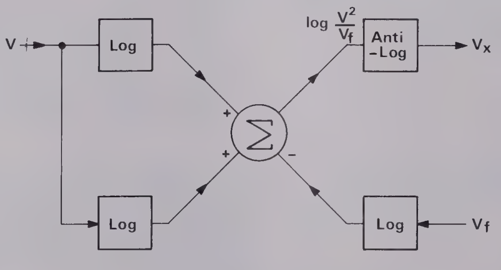

V
Log
Log
log $\frac{V^2}{V_f}$
Anti
-Log
V_x
+
+
-
Log
V_f

FIG. 3.25 BLOCK DIAGRAM OF RMS
CONVERSION TECHNIQUE

3.3.4 High Frequency Compensation

During the calibration cycle, the microprocessor notes and stores the high frequency (HF) error of each range. When AC volts is selected the compensation information for a particular range is recalled by the microprocessor, transferred across the isolation barrier and latched on to M13, M14 (Drawing No. 430328 sheet 5), see Fig. 3.26. As in the case of the Input Current Compensation (section 3.2.2.5), the output from the latches is applied to a digital-to-analog converter, AN2. The voltage produced is fed to the AC converter via connector J1 pin 11 and applied to varicap D11. The varicap is thus adjusted to give the amplifier chain a flat frequency response.

The calibration is carried out at one H.F. frequency but since it flattens the AC amplifier response, the correction is valid for all specified frequencies. It should be noted that the calibration routine is iterative since the varicap is non-linear.

3.3.5 Frequency Detection (430402 sheet 2)

The signal frequency is monitored by M10 which is set so that a signal frequency greater than 5kHz causes a logic '1', (0 volts) on M10 - 4. This signal indicates to the Digital Board via M18, M2 (Drawing No. 430328 sheet [illegible]) which one of the two sets of specifications should be used for calculating the measurement uncertainty when the ERROR key is depressed.

3.3.6 Test

During the self-test routine (actuated from the front panel or remotely programmed) the AC assembly is checked for correct operation. The circuitry is placed into the .1V range as described in Section 3.2.1.3. Filter is selected and F.E.T. Q31 is 'closed' from M5 - 13 causing a signal of 0.08 volts DC to be injected into the preamplifier. Thus a signal of approximately 3.14 volts is output from the RMS section and applied to the A - D converter situated on the Analog assembly. This signal is then measured and compared with a stored value. If the measured signal is within ±6% of the stored value, the test continues with a 1V range check.

Range	Output from RMS section
.1	+3.14 volts
1	+0.314 volts

3.4 OHMS ASSEMBLY (Circuit Drawing No. 430331)

The instrument functions by measuring the voltage across an unknown resistance with a known constant current flowing in it. The converter can be split into two parts: a low drift voltage follower and a constant current source covering 6 decades from 100nA to 10mA (see Fig. 3.27).

It should be noted that when the Ohms assembly is fitted the DC Isolator Lo is no longer directly connnected to the front/rear panel Lo terminal, but goes via RL1 on the Ohms assembly (connector link removed on side panel). Lo becomes an active terminal in resistance measurements.

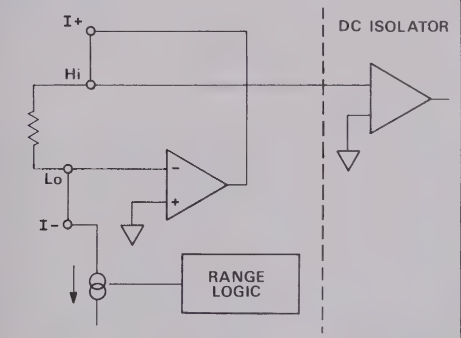


FIG. 3.27 SIMPLIFIED RESISTANCE CONVERTER

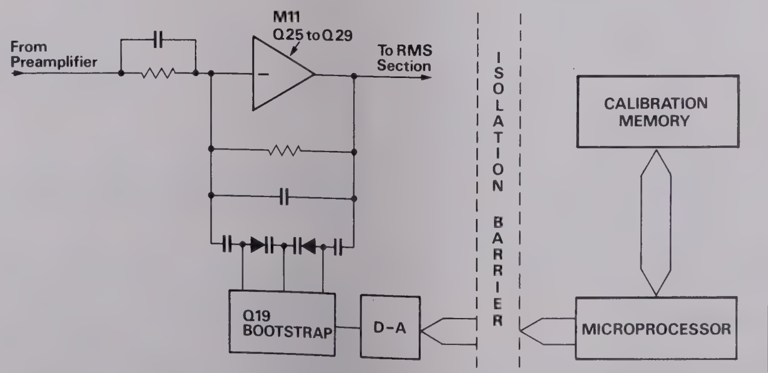


FIG. 3.26 SIMPLIFIED DIAGRAM OF AC HIGH FREQUENCY COMPENSATION

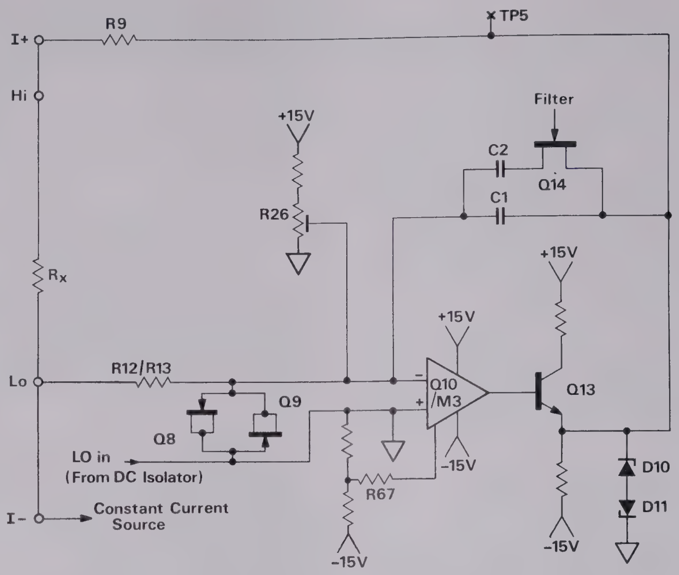


FIG. 3.28 SIMPLIFIED DIAGRAM OF
VOLTAGE FOLLOWER CIRCUIT

3.4.1 Low Drift Voltage Follower

When OHMS is selected, the front panel Lo terminal is connected to the –ve input of amplifier Q10/M3, the +ve input being referred to DC isolator Lo (this remains reference common). Q10/M3 together with output follower Q13, will thus apply a voltage at the I+ terminal via RL1 such that the voltage at front panel Lo is at reference common plus any offset due to Q10/M3. This voltage offset drift is kept small for changes of temperature by compensating the input bias current of Q10 with the current in R67, which changes with temperature due to the voltage drift at Q10 emitters. Q10 input bias current is initially nulled by R26.

Thus if we consider 2-wire measurement, I+ is linked to Hi, I– is linked to Lo and the unknown resistance linked between Hi and Lo, with a constant current flowing from I+/Hi, through the unknown resistance (R_x) to Lo/I–. The Lo terminal is maintained at 0V. Therefore the Hi terminal (DC Isolator Input) is at $I_{constant} \times R_x$ volts above Lo. As long as the error is small referred to reference 0, the DVM will read the correct resistance.

Input protection is provided as follows:–

Voltage/Current applied to input terminals:

I+	R9, D10, D11
I–	R2, D1, D2, Q25, R23
Lo	R12, R13, Q8, Q9

Open circuit voltage limit protection:

I+	R15, R16, Q6, Q7
I–	R6, D7, D8, Q2, Q22

3.4.2 Constant Current Source

Seven decades of ohms ranges are provided by 6 ranges of current and 2 ranges of DC Isolator voltage gain (100mV range for 10Ω, 1V range otherwise). See Fig. 3.29.

Range	Current	F.E.T.'s/Switches turned on	
		Current Selector	Leakage path
10Ω	10mA	Q11, M2(A)	
100Ω	10mA	Q11, M2(A)	
1kΩ	1mA	M1(A)	
10kΩ	100μA	M1(B)	
100kΩ	10μA	Q4	M2(B)
1MΩ	1μA	Q1, M1(D)	Q3, M2(C)
10MΩ	100nA	Q1, M1(C)	Q3, M2(C)

FIG. 3.29 OHMS CURRENT RANGE SWITCHING

When kΩ's is selected, Q17 (sheet 2) is turned on enabling astable M6 to produce a 200Hz signal to switch M5. Thus when gates B and C of M5 are open, C9 is charged up from the negative reference (originating from the analog section of the A - D converter). These gates then close and A and B open, sharing the charge with C8, the voltage across C8 equals the reference voltage (sheet 1).

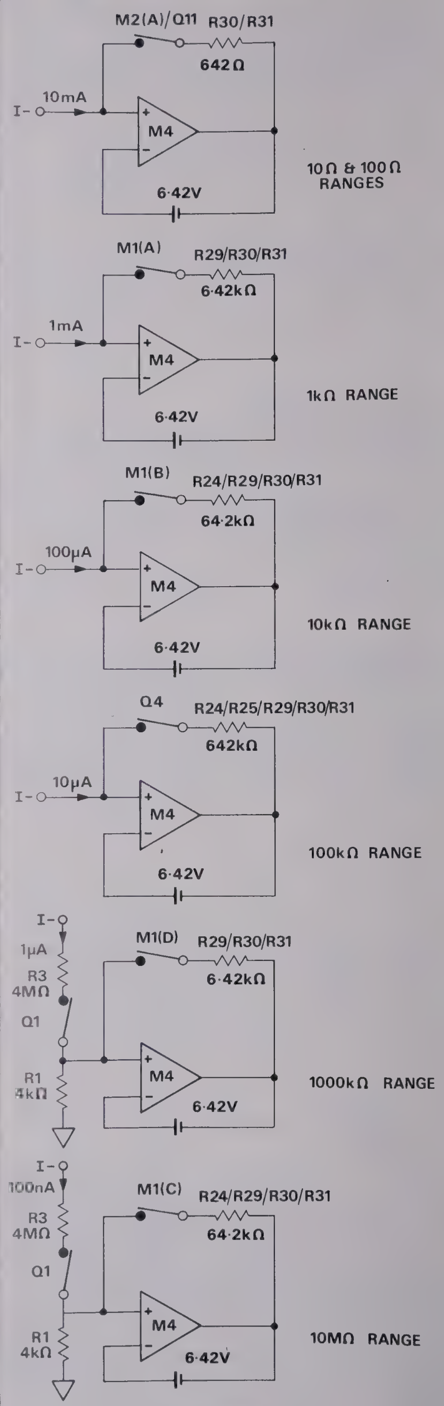

M2(A)/Q11 R30/R31
642Ω
10mA
I-
M4
6·42V
10Ω & 100Ω RANGES
M1(A) R29/R30/R31
6·42kΩ
1mA
I-
M4
6·42V
1kΩ RANGE
M1(B) R24/R29/R30/R31
64·2kΩ
100μA
I-
M4
6·42V
10kΩ RANGE
Q4 R24/R25/R29/R30/R31
642kΩ
10μA
I-
M4
6·42V
100kΩ RANGE
I-
1μA
R3 4MΩ
Q1
M1(D) R29/R30/R31
6·42kΩ
R1 4kΩ
M4
6·42V
1000kΩ RANGE
I-
100nA
R3 4MΩ
Q1
M1(C) R24/R29/R30/R31
64·2kΩ
R1 4kΩ
M4
6·42V
10MΩ RANGE

FIG. 3.30 SIMPLIFIED Ω CURRENT SWITCHING

The voltage developed across C8 causes M4 to sink current through resistor chain R24, R25, R29, R30, R31 until the voltage developed across the chain balances that across C8. Thus the current required for a particular range is selected by the value of the resistor chain switched byM1, M2 and Q4. Simplified diagram Fig. 3.30 shows the resistor chain and switching for each range. On the high resistance ranges leakage paths are provided by Q3, M2(B) and M2(C).

To produce good common mode rejection, M4 supplies are bootstrapped, the supply span being defined by a 12 volt zener, D17. The filtered bootstrap supplies (+ΩBS and –ΩBS) power the astable (M6) and bilateral switch.

The use of ohms guard permits in-circuit measurement of resistors, provided shunt paths are greater than 250Ω and a suitable tapping point is available. Consider Fig. 3.31. Guard is reference 0, Lo is actively maintained within microvolts of reference 0 (as previously explained). Thus there is no voltage across Rz and consequently no current in Rz. Voltage follower Q10/M3 will simply pass more current into Ry from the I+ terminal until the selected current for the particular range flows through Rx.

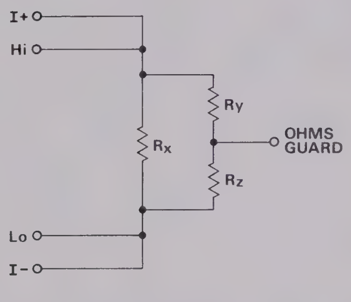

I+
Hi
Ry
Rx
OHMS GUARD
Rz
Lo
I-

FIG. 3.31 USE OF OHMS GUARD

3.4.3 Test

During the self-test routine (actuated from the front panel or remotely programmed), the Ohms Converter is checked for correct operation. The circuitry is placed into the 10kΩ range as described in Section 3.2.1.3. Filter is selected and F.E.T. Q5 'closed' from M9-1 causing R8 (9.76kΩ) to be placed between I+ and I–. Thus with I+ and Hi, I– and Lo connected (2-wire if front panel input selected), the DC Isolator (which is also in the TEST mode) measures the voltage developed across the resistor (approx 1 volt). The resulting voltage output from the DC Isolator is applied to the A-D converter, measured and compared to the stored value. If the measured signal is within ± 6% of the stored value, the test is complete.

3.5 CURRENT ASSEMBLY (Drawing No. 430304)

The Current assembly contains a set of selectable precision current shunts, the voltage developed across the shunt(s) being sampled by the DC or AC voltage measurement circuits.

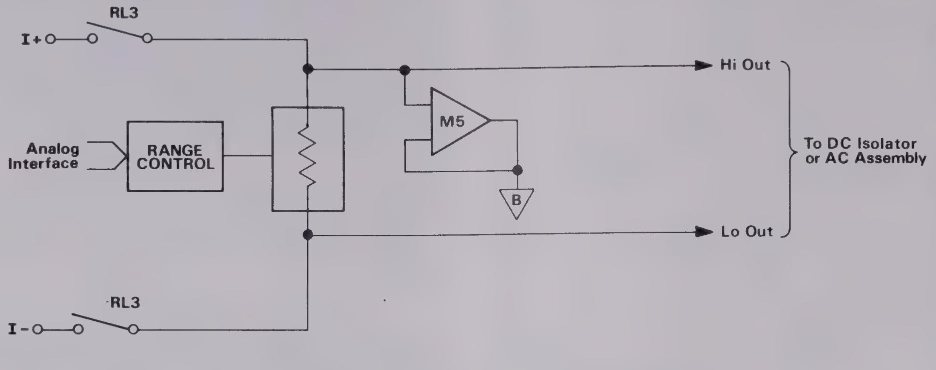


FIG. 3.32 SIMPLIFIED DIAGRAM OF CURRENT ASSEMBLY

3.5.1 Current Measurements

Precision current shunts of 0.1Ω, 1Ω, 9Ω, 90Ω and 900Ω connected in series provide an output of 100mV for a full range signal. To eliminate errors in measurement due to lead or contact resistance, all current shunts are 4-wire sensed i.e. a pair of current leads and a pair of voltage leads to the shunt(s) switched separately. The voltage developed across the shunt(s) is fed to the DC Isolator in DCI and the AC assembly in ACI or DCI + ACI. The latter, DC coupled mode, computing the RMS value of the DC and AC component of the input current. These circuits are placed in the '.1V range' amplifying the signal by 3.16. The output of buffer M5 is used to guard leakage paths on the current board.

Overload protection up to 2 amps is provided by diodes D13 — D16. An input greater than 2 amps causes the current fuse, located on the rear panel, to blow.

3.5.2 Test

During the self test routine, the Current assembly is checked for correct operation. The circuitry is placed into the .1mA DC current range as described in Section 3.2.1.3 with the DC Isolator in the 100mV range. Filter is selected and F.E.T. Q9 closed from M4 — 10 allowing current to flow through R18 to the 100μA range shunts, from the +15V supply. Thus a voltage of approximately 0.3 volts is developed across the shunts and fed to the DC Isolator. This voltage combined with the effect of the voltage injected due to the DC Isolator being in Test (Section 3.2.2.6) causes the output of the DC Isolator to be approximately 5.75 volts. After measurement by the A-D converter, the value is compared to the stored value. If the measured signal is within 6% of the stored value, the test is complete.

3.6 REAR INPUT/RATIO INPUT (Circuit Drawing No. 430307).

3.6.1 General

The Rear Input/Ratio Input assembly contains the switching circuitry to enable one of the three analog signal sources to be connected to the measurement circuits of the DVM. When Rear Input is selected either remotely or on the rear panel of the instrument and the RATIO key is depressed, the switching circuitry, under microprocessor control, selects the ratio (reference) input then the rear (signal) input, taking one valid reading at each stage.

3.6.2 Front Panel/Rear Panel Input

When Front Input is selected, either remotely or on the rear panel, this causes the base of Q1 to be connected to 0 volts, turning on the transistor. Thus relays RL1 and RL2 are energised, causing the front signal input terminals to be connected to the measurement circuits. Should Rear Input be selected, relays RL1 and RL2 are de-energised, connecting the rear input to the measurement circuits.

3.6.3 Ratio

During the last part of the analog interface update sequence (see Fig. 3.6) M1-5 is taken high causing the flip-flop (M1) to be clocked high (0 volts) on pin 1. The signal is applied to Q2 energising the ratio mode input selector relays, RL3 and RL4. Thus the inputs to the 'Ratio Input' on the rear panel are connected to the measurement circuits. Once a valid reading has taken place, the 'Rear Input' lines are connected to the measurement circuits by leaving M1-5 low. This de-energises the relays as Q2 is turned off. Another reading is then taken and the ratio calculated.

3.6.4 Test

When TEST is selected, the ratio option is checked to see if it is fitted, by interrogating the AD4 line to see if it is held high.

3.7 ANALOG OUTPUT (Circuit Drawing No. 430308)

3.7.1 General

The Analog Output Board accepts the DC Isolator or AC Converter Output and converts it to a ±1 volt DC full range output. This signal can then be used, for example, to drive X-Y plotters or strip chart recorders.

3.7.2 Description

The 3.16V full range signal from the DC Isolator or AC Converter is buffered by unity gain amplifier M2. The output is potentially divided by R7 and R8 so that 1 volt full range is presented to M1, another unity gain amplifier. Potentiometer R5 is adjusted to remove any offset caused by M1 and M2. Positive temperature coefficient thermistors R3, R4 and diodes D1, D2, protect the Analog Output circuitry from accidental input applied to the Analog Output external connector.

3.8 DIGITAL ASSEMBLY (Circuit Drawing No. 430329)

The Digital assembly contains the circuitry providing the general management of the instrument and the digital section of the A-D converter. Fig. 3.33 outlines the main portions and signal highways of this board.

3.8.1 Processor and Memory (430329 sheet 1)

A 6800 microprocessor (MPU) together with 8k bytes of memory controls the communication between the front panel, digital interface, display drivers, Digital and analog assemblies. The memory can be split into five main areas:—

(1) Program Memory - needed to operate the whole instrument system.

(2) Constant Data Memory - e.g. Self Test limits, Error read-out specifications and other fixed factors.

(3) Non-volatile Calibration Memory - used to store all the calibration errors used for each reading and determined during the 'Auto-cal' cycle.

(4) Operating Memory - used for scratch pad operations and storing.

(5) Volatile Display Memory - volatile data such as Max-Min stores, Limit stores and computation stores.

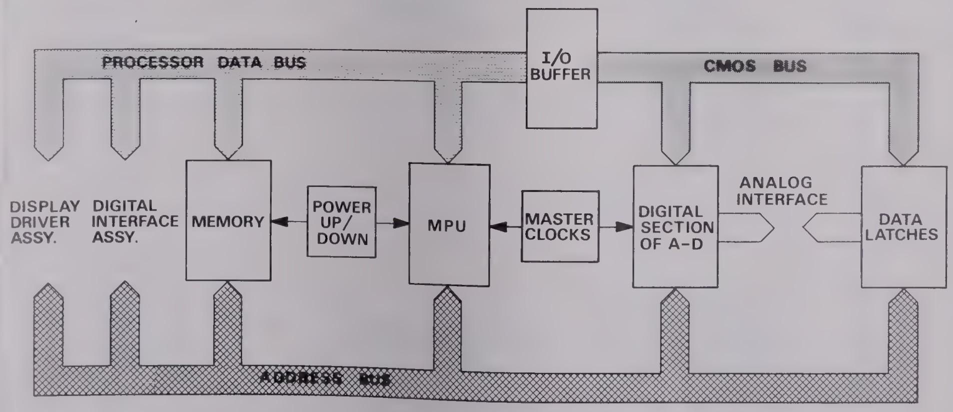


FIG. 3.33 SIMPLIFIED BLOCK DIAGRAM OF DIGITAL ASSEMBLY

3.8.1.1 Software Overview

The system uses the technique of a looping prioritised job scheduler (see Fig. 3.34). Each job driven from the scheduler is controlled by a flag in the system workspace which is set when the job is required to be run and cleared when completed. Priority of activation is ensured by making each job exit on completion, to the top of the schedule.

Program Modules: The program memory is split into a series of functional modules, each module corresponding fairly closely to a major functional area and hence to one of the jobs activated by the job scheduler, the larger ones being sub-divided, see Drawing No. 890011.

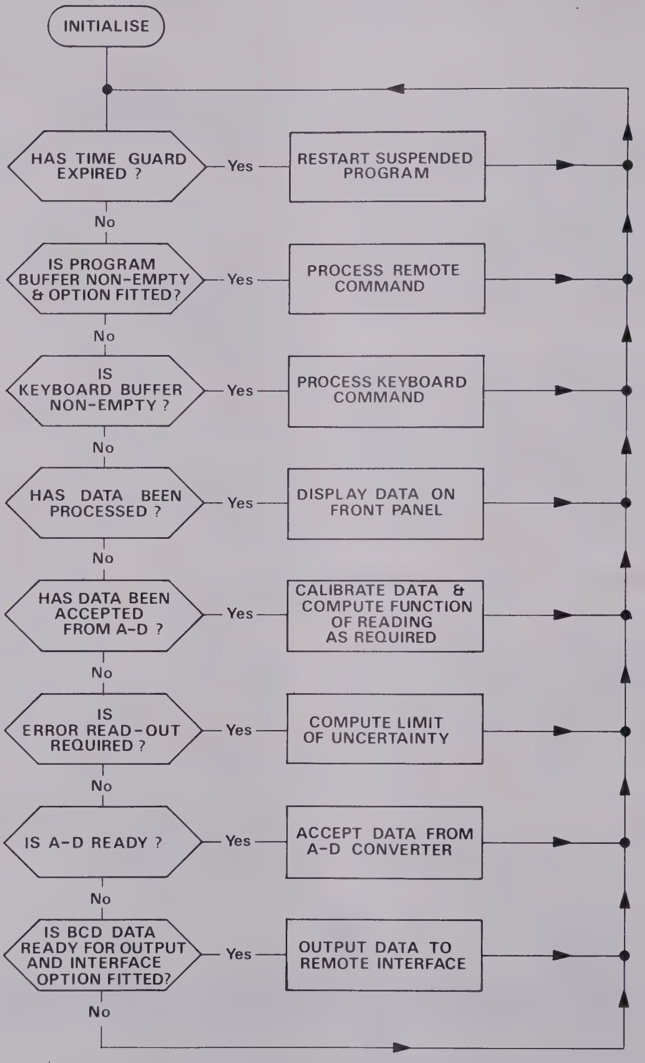

INITIALISE
HAS TIME GUARD EXPIRED ?
Yes
RESTART SUSPENDED PROGRAM
No
IS PROGRAM BUFFER NON-EMPTY & OPTION FITTED?
Yes
PROCESS REMOTE COMMAND
No
IS KEYBOARD BUFFER NON-EMPTY ?
Yes
PROCESS KEYBOARD COMMAND
No
HAS DATA BEEN PROCESSED ?
Yes
DISPLAY DATA ON FRONT PANEL
No
HAS DATA BEEN ACCEPTED FROM A-D ?
Yes
CALIBRATE DATA & COMPUTE FUNCTION OF READING AS REQUIRED
No
IS ERROR READ-OUT REQUIRED ?
Yes
COMPUTE LIMIT OF UNCERTAINTY
No
IS A-D READY ?
Yes
ACCEPT DATA FROM A-D CONVERTER
No
IS BCD DATA READY FOR OUTPUT AND INTERFACE OPTION FITTED?
Yes
OUTPUT DATA TO REMOTE INTERFACE
No

FIG. 3.34 JOB SCHEDULER

3.8.1.1 Software Overview

The system uses the technique of a looping prioritised job scheduler (see Fig. 3.34). Each job driven from the scheduler is controlled by a flag in the system workspace which is set when the job is required to be run and cleared when completed. Priority of activation is ensured by making each job exit on completion, to the top of the schedule.

Program Modules: The program memory is split into a series of functional modules, each module corresponding fairly closely to a major functional area and hence to one of the jobs activated by the job scheduler, the larger ones being sub-divided, see Drawing No. 890011.

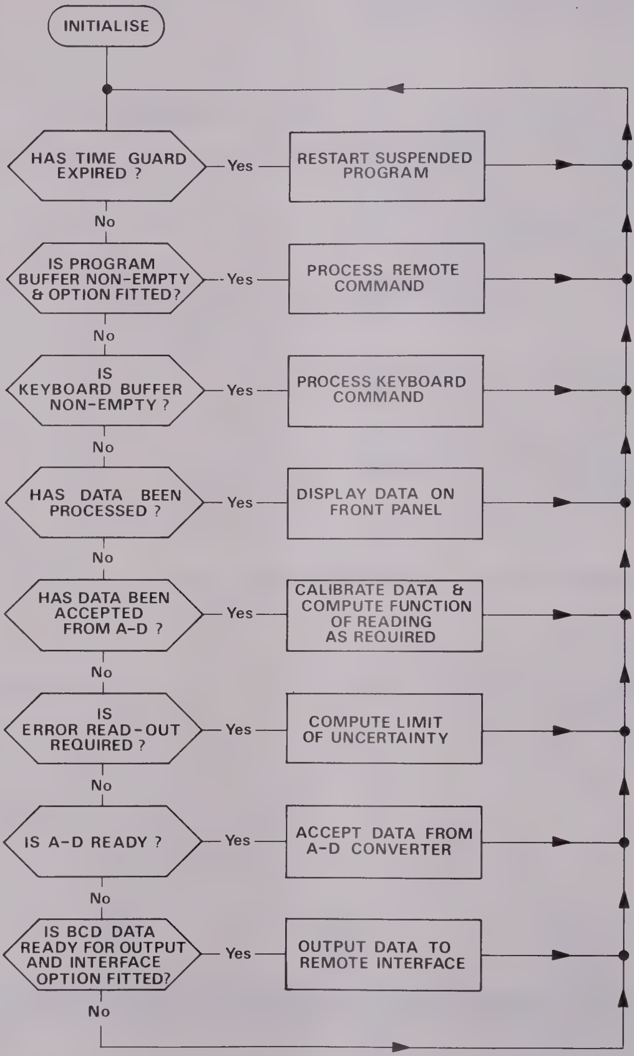

INITIALISE
HAS TIME GUARD EXPIRED ?
Yes
RESTART SUSPENDED PROGRAM
No
IS PROGRAM BUFFER NON-EMPTY & OPTION FITTED?
Yes
PROCESS REMOTE COMMAND
No
IS KEYBOARD BUFFER NON-EMPTY ?
Yes
PROCESS KEYBOARD COMMAND
No
HAS DATA BEEN PROCESSED ?
Yes
DISPLAY DATA ON FRONT PANEL
No
HAS DATA BEEN ACCEPTED FROM A-D ?
Yes
CALIBRATE DATA & COMPUTE FUNCTION OF READING AS REQUIRED
No
IS ERROR READ-OUT REQUIRED ?
Yes
COMPUTE LIMIT OF UNCERTAINTY
No
IS A-D READY ?
Yes
ACCEPT DATA FROM A-D CONVERTER
No
IS BCD DATA READY FOR OUTPUT AND INTERFACE OPTION FITTED?
Yes
OUTPUT DATA TO REMOTE INTERFACE
No

FIG. 3.34 JOB SCHEDULER

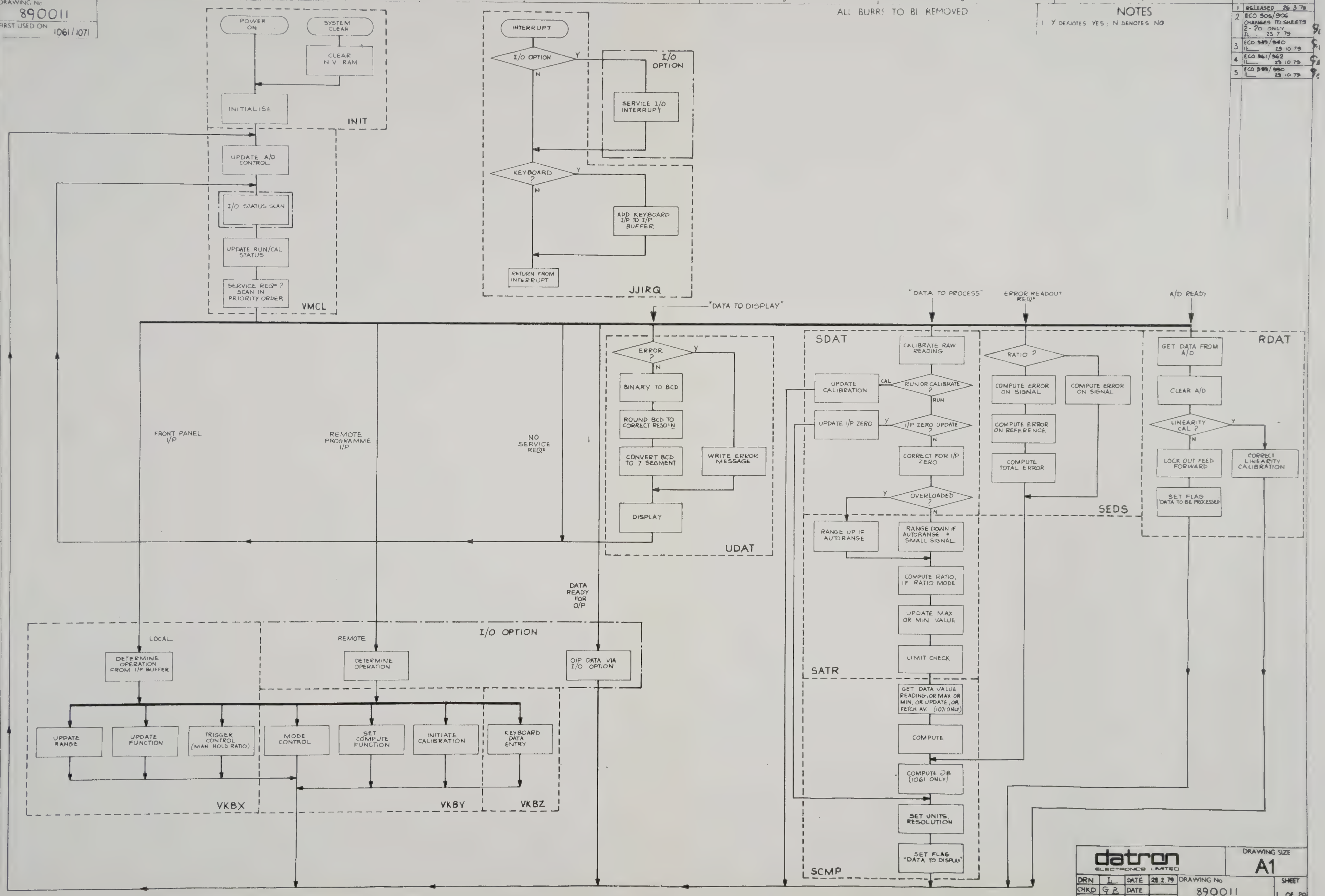
DRAWING No
890011
FIRST USED ON 1061/1071

ALL BURRS TO BE REMOVED

NOTES

1 Y DENOTES YES ; N DENOTES NO

ISS	CHANGES
1	RELEASED 26 3 79
2	ECO 905/906 CHANGES TO SHEETS 2-20 ONLY IL 25 7 79
3	ECO 939/940 IL 29 10 79
4	ECO 961/962 IL 29 10 79
5	ECO 989/990 IL 29 10 79



1
2
3
4
5
6
7
A
B
C
D
E
POWER ON
SYSTEM CLEAR
CLEAR N V RAM
INITIALISE
INIT
UPDATE A/D CONTROL
I/O STATUS SCAN
UPDATE RUN/CAL STATUS
SERVICE REQᵈ ? SCAN IN PRIORITY ORDER
VMCL
INTERRUPT
I/O OPTION
Y
N
I/O OPTION
SERVICE I/O INTERRUPT
KEYBOARD ?
ADD KEYBOARD I/P TO I/P BUFFER
RETURN FROM INTERRUPT
JJIRQ
"DATA TO DISPLAY"
"DATA TO PROCESS"
ERROR READOUT REQᵈ
A/D READY
FRONT PANEL I/P
REMOTE PROGRAMME I/P
NO SERVICE REQᵈ
ERROR ?
BINARY TO BCD
ROUND BCD TO CORRECT RESOᴸN
CONVERT BCD TO 7 SEGMENT
WRITE ERROR MESSAGE
DISPLAY
UDAT
SDAT
CALIBRATE RAW READING
RUN OR CALIBRATE ?
CAL
RUN
UPDATE CALIBRATION
I/P ZERO UPDATE ?
UPDATE I/P ZERO
CORRECT FOR I/P ZERO
OVERLOADED ?
RANGE UP IF AUTO RANGE
RANGE DOWN IF AUTORANGE + SMALL SIGNAL
COMPUTE RATIO, IF RATIO MODE
UPDATE MAX OR MIN VALUE
LIMIT CHECK
SATR
GET DATA VALUE READING, OR MAX OR MIN, OR UPDATE, OR FETCH AV. (1071 ONLY)
COMPUTE
COMPUTE ∂B (1061 ONLY)
SET UNITS, RESOLUTION
SET FLAG "DATA TO DISPLAY"
SCMP
RATIO ?
COMPUTE ERROR ON SIGNAL
COMPUTE ERROR ON REFERENCE
COMPUTE TOTAL ERROR
COMPUTE ERROR ON SIGNAL
SEDS
RDAT
GET DATA FROM A/D
CLEAR A/D
LINEARITY CAL ?
LOCK OUT FEED FORWARD
CORRECT LINEARITY CALIBRATION
SET FLAG "DATA TO BE PROCESSED"
DATA READY FOR O/P
I/O OPTION
LOCAL
REMOTE
DETERMINE OPERATION FROM I/P BUFFER
DETERMINE OPERATION
O/P DATA VIA I/O OPTION
UPDATE RANGE
UPDATE FUNCTION
TRIGGER CONTROL (MAN HOLD RATIO)
MODE CONTROL
SET COMPUTE FUNCTION
INITIATE CALIBRATION
KEYBOARD DATA ENTRY
VKBX
VKBY
VKBZ

datron
ELECTRONICS LIMITED

DRAWING SIZE
A1

DRN	IL	DATE	28.2.79
CHKD	GB	DATE	
APPD		DATE	

DRAWING No
890011

SHEET
1 OF 20

Data Control: Data handled by the system consists of a stream of measurement information on which a number of operations are carried out and a second stream, asynchronous with the first, consists of commands derived from the front panel or digital interface controlling both the measurement circuits and computation programs. Operations on the measurement stream basically consist of acquiring the raw data from the A-D converter, calibrating this data and carrying out any other computations, and converting and formatting the data for output. Note that a job consuming data is given higher priority than the one producing data for it, allowing a producer to place data into an empty buffer. The consumer is activated by a flag, set by the producer to indicate data ready in the buffer.

Process Control: Control of the instrument by the processor, initiated from the front panel or digital interface, is arranged by using a 'pipeline control' of the major system state and a 'first in/first out' buffer between the interrupt level routine receiving the control command and the main program implementing it. The major system state consists of the range, function, resolution, filter, ratio, autorange, etc., flags and the computation mode (reading, A–B, ÷C, etc.). The pipeline comprises three levels. The top, level 1, reflects the state being programmed, the second, level 2, the state of the measurement circuits and the third, level 3, the measurement being processed. When a command is input, level 1 is updated (e.g. a new range is selected) and as soon as the measuring circuits are not converting an input signal, the state in level 1 is moved to level 2 causing the measurement circuits to update to the new state. When an A-D conversion is complete, data is read from the A-D and the state transferred from level 2 to 3, providing information for the processing routines. Additionally, at this time, the level 1 to level 2 transfer is repeated and the measurement circuits again updated to allow for commands received while the conversion is in progress.

A second control mechanism used is to input all the commands via a 'first in/first out' buffer between the interrupt level routine receiving the command and the main program implementing it. Thus the processor under remote control is able to 'simultaneously' set up the requirements for the next reading, convert the current reading and process the last one.

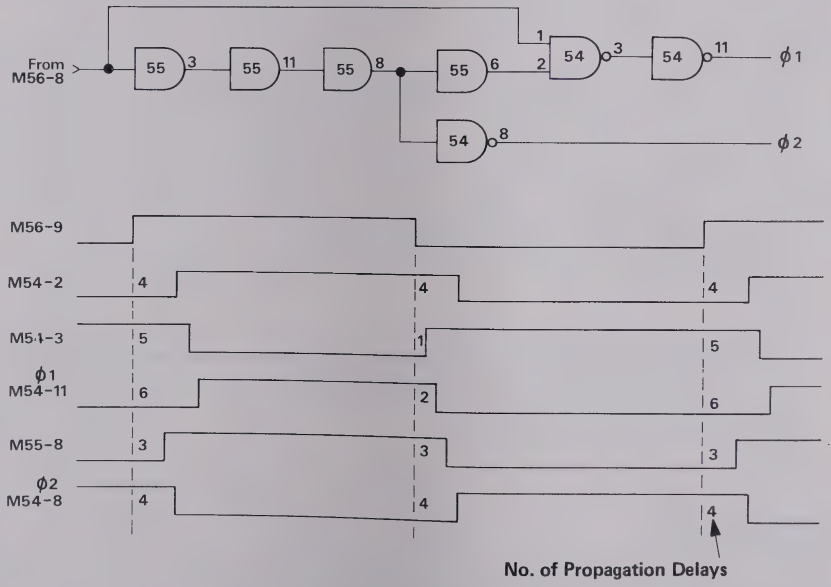


FIG. 3.35 TWO-PHASE CLOCK GENERATION

3.8.1.2 The Two-Phase Clock

The 6800 requires a non-overlapping positive two-phase (Ø1, Ø2) clock and is derived from the line locked master clock (sheet 4) producing a 1.6MHz (50Hz supply) or 1.9MHz (60Hz supply) signal. M57 acts as a ÷2 thus antiphase 800kHz square-waves appear on pins 14 and 15. If data is not being transferred to the CMOS Bus, M57-11 is high, thus M56-8 follows M57-15. The non-overlapping of Ø1 and Ø2 is produced by the utilisation of the inherent propagation delay (approx. 10nS) through each gate of M54 and M55. This is best seen by referring to Fig. 3.35 the circuitry around the output stage increasing the voltage levels demanded by the processor (0V and +5V).

During a period when data is being transferred across the CMOS Data Bus, Ø1 and Ø2 are reduced to 400kHz by utilising the other half of M57. The signal CMOS I/O is high thus a 400kHz square-wave is output on M57-11, the waveforms of Ø1 and Ø2 are altered such that one half of the period is stretched, covering 1½ cycles of the normal 800kHz operation. (See Fig. 3.36).

3.8.1.3 RAM/ROM Circuit

The 6800 uses two ROM's which contain the programs necessary to run the instrument. Each ROM is able to store up to 4096, 8 bit 'words' of program information which are grouped in program modules. Both ROM's receive the address information output by the processor on to the Processor Address Bus. The particular ROM to be addressed being selected by decoding three of the address lines and applying the resultant to the 'chip select' line (via M34 pins 6 or 8) (See Fig. 3.37).

The information held in that particular location is sent back to the processor via the Processor Data Bus.

The processor also uses 512 bytes of 8-bit wide RAM made up from four 256 x 4 bit RAM'S. Half of this memory (M19/20) is backed up with a battery to provide the non-volatile calibration and 'input zero' store and can only be overwritten when CAL or INPUT ZERO is selected. The remaining 256 bytes (M36/37) are used as operating memory for scratch pad operations and storing volatile data (e.g. Max, Min). A particular location is set by the 6800 on the Processor Address Bus using A_0 to A_7, the pair of RAM'S being selected by decoding some of the other Processor Address lines with VMA.Ø2. Control of the read/write lines is performed by the MPU, the signal being gated with a 'Master Clock ÷ 2' signal to provide correct timing.

An instrument power up is detected by M60/M62 causing an initialisation $\overline{\text{RESET}}$signal to be fed to the MPU via Q16. (See Fig. 3.38).

During a power-up or power-down (+5V supply line < +4.75 V) a signal from the supply-level detectors prevents RAMS M19 and M20 from being overwritten by holding the CS (chip select) lines low (<0.2 volts) via Q14 for a period of approx. 25mS determined by R55/C32.

3.8.2 CMOS Address Decode and Input/Output Circuits (430329 sheet 2)

Information is transferred to and from CMOS devices via the CMOS Data Bus during periods when the signal CMOS I/O is high (M33-6). This takes place when the Processor Address Bus bits A11, A14 and A15 are high. The transfer of data between the Processor Data Bus and the CMOS Data Bus takes place at 400kHz, the Read/Write lines selecting the direction of information through the tri-state buffers M4, M5 and M6.

In order to uniquely address the various CMOS input/output devices, the address lines must be further decoded. M16 and M32 are dual 2 to 4-line decoders using the states of CMOS I/O and address lines A0, A1, A4, A5 to enable or partially enable the input/output devices, except the output of M16 pins 2 and 15 which are inverted and gated with data line A2 to produce the required decode.

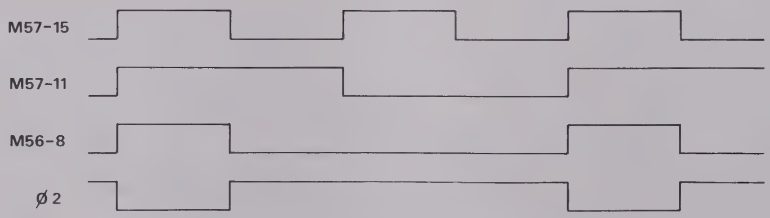


FIG. 3.36 TIMING DIAGRAM OF STRETCHED TWO-PHASE CLOCK

switch on),
from M37-
trol lines $\bar{A}$,
nto RESET
al XADDLY
lay counters
amount of
e, function
tches, M11
) reset the
olution of
ger gate
(M12-6).

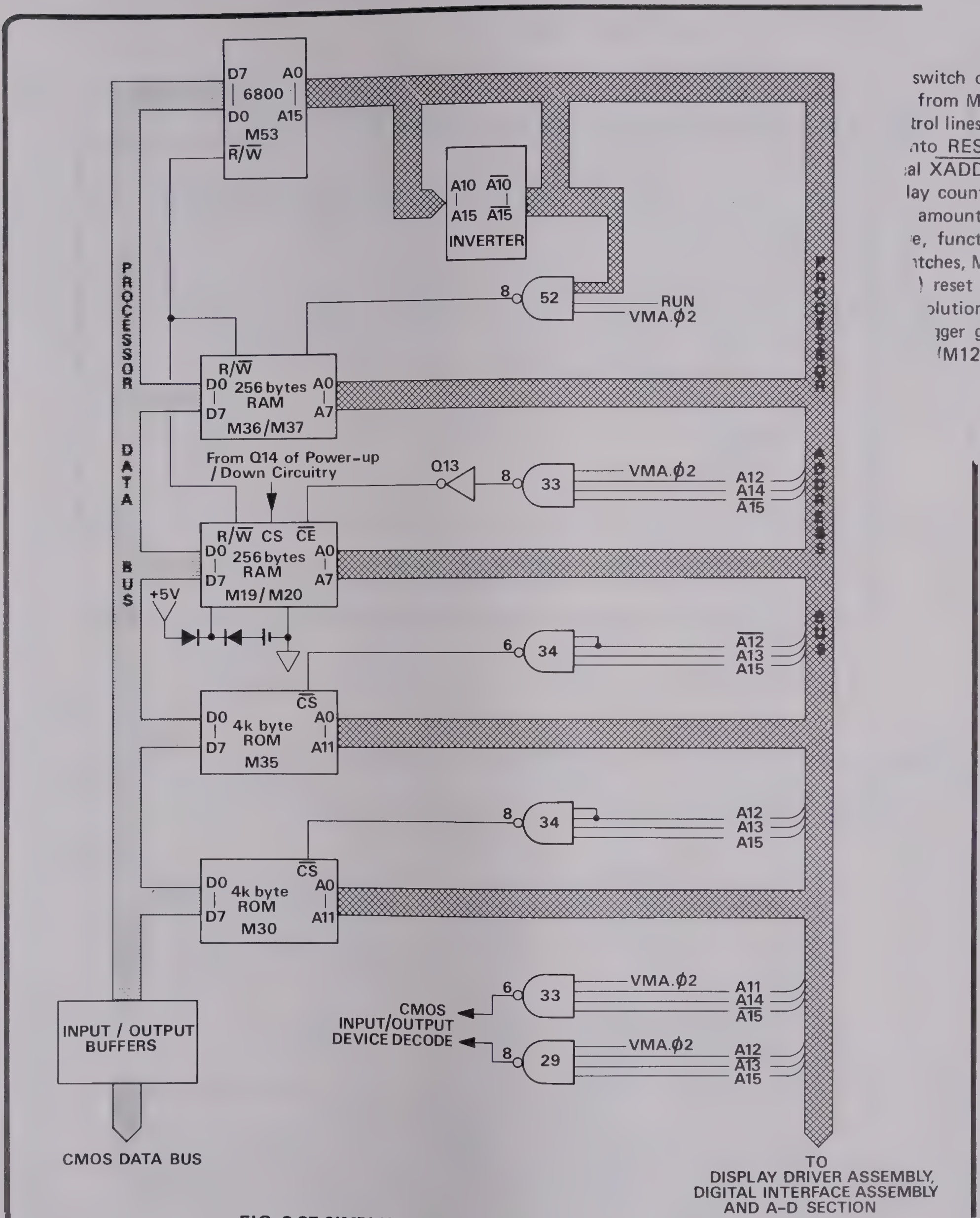

D7 A0
6800
D0 A15
M53
R/W̄
A10 Ā10
A15 Ā15
INVERTER
8
52
RUN
VMA.ϕ2
PROCESSOR DATA BUS
PROCESSOR ADDRESS BUS
R/W̄
D0 256 bytes A0
RAM
D7 A7
M36/M37
From Q14 of Power-up / Down Circuitry
Q13
8
33
VMA.ϕ2
A12
A14
Ā15
R/W̄ CS C̄Ē
D0 256 bytes A0
RAM
D7 A7
M19/M20
+5V
6
34
Ā12
A13
A15
C̄S̄
D0 4k byte A0
ROM
D7 A11
M35
8
34
A12
A13
A15
C̄S̄
D0 4k byte A0
ROM
D7 A11
M30
6
33
VMA.ϕ2
A11
A14
Ā15
CMOS INPUT/OUTPUT DEVICE DECODE
8
29
VMA.ϕ2
A12
Ā13
A15
INPUT / OUTPUT BUFFERS
CMOS DATA BUS
TO DISPLAY DRIVER ASSEMBLY, DIGITAL INTERFACE ASSEMBLY AND A-D SECTION

FIG. 3.37 SIMPLIFIED DIAGRAM OF MEMORY CIRCUITS

3.8.1.2

The
phase (01,
master cloc
or 1.9MHz
antiphase 8C
If data is no
is high, thus
of 01 and 0
propagation
M54 and M5
the circuitry
age levels d

During
the CMOS
utilising th
thus a 40
forms of
period i
800kHz

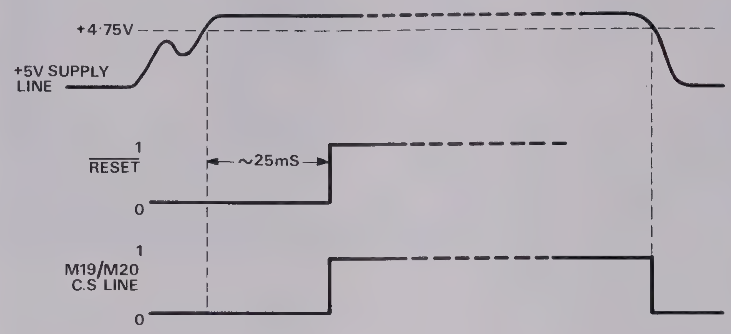


FIG. 3.38 START UP AND NON-VOLATILE RAM PROTECTION

A5	A4	A2	A1	A0	SIGNAL	M32/M16 Pin No.	Operation
0	0	1	X	X	$\overline{\text{XKYBRD}}$	M32-7	Keyboard read/write
0	1	X	X	X		(M32-6)	Forces a MPU 'power up' sequence
1	0	1	X	X	$\overline{\text{XADDT}}$	M32-5	A-D main counter output enable
1	1	X	X	X		(M32-4)	Analog interface address latch input enable
0	0	X	0	0	$\overline{\text{XKDSP0}}$	M16-7	partially enables input to keyboard l.e.d. latches
0	0	X	0	1	$\overline{\text{XKDSP1}}$	M16-6	
0	0	X	1	0	$\overline{\text{XKDSP2}}$	M16-5	
0	0	X	1	1	$\overline{\text{XKDSP3}}$	M16-4	
1	0	X	0	0	XADSTA	M16-9	A-D, and interupt status output enable
1	0	X	0	1		M16-10	Error switch output enable
1	0	X	1	0	$\overline{\text{XADCTL}}$	M16-11	A-D control latches, input enable
1	0	X	1	1	$\overline{\text{XADDLY}}$	M16-12	A-D delay counter input enable

FIG. 3.39 CMOS ADDRESS DECODING

3.8.3 Analog to Digital Conversion (Digital Section)

3.8.3.1 General Principle

Block diagram Fig. 3.40 outlines the essentials of the digital section and should be used with flowchart Fig. 3.41 in order to follow the operation of this section.

The function of this section of the circuitry is to generate the sequence that when transferred to the analog section, controls the sequence from RESET through the integration cycle and back to RESET. The circuitry controls the length of SIG and BIAS and counts during REF 1 and REF 2, the accumulated count being proportional to the length of the reference periods, which in turn is proportional to the measured input signal. At the end of each reading cycle the count is read by the MPU, processed and displayed.

3.8.3.2 Preset Procedure

As part of the initialisation routine (at switch on), M47 (used as the sequence controller), is reset from M37-11, causing M47-2 to be logic '1'. Thus the control lines $\overline{A}$, $\overline{B}$ and $\overline{C}$ put the analog section of the A-D into RESET (See Fig. 3.42). The Address Bus decoded signal $\overline{\text{XADDLY}}$ is taken low, enabling the presetting of the delay counters M13 and M14 from the CMOS Data Bus, the amount of delay being determined by the selected range, function and filter state, see Fig. 3.43. The A-D control latches, M11 and M12 are then enabled by $\overline{\text{XADCTL}}$ to (i) reset the command latch M1 (from M11-4), (ii) set the resolution of the main counter (M11-5 and 6), (iii) select trigger gate (M12-3, 4 or 5) and (iv) reset the data ready latch (M12-6).

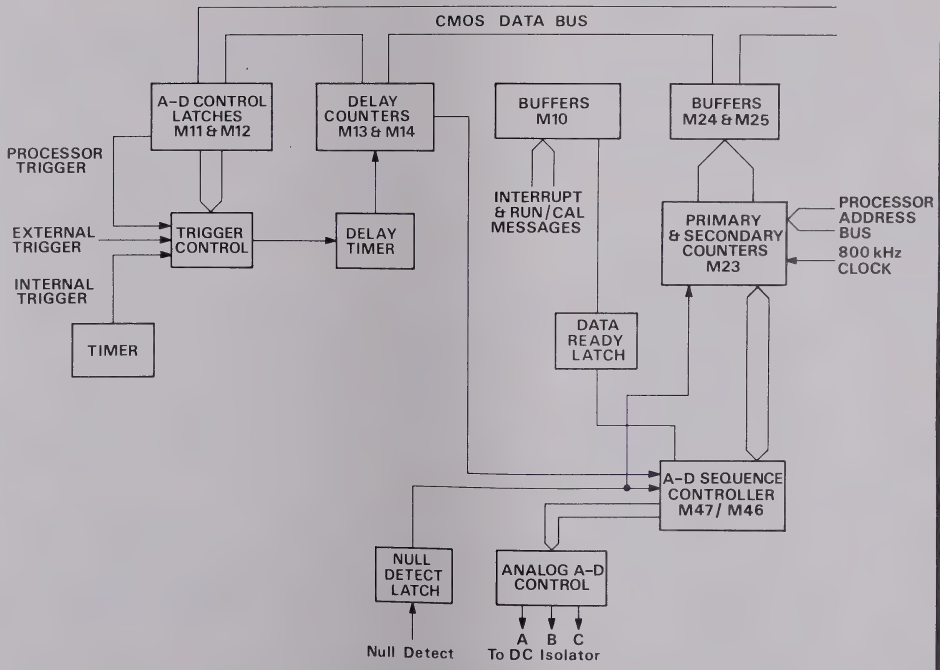

CMOS DATA BUS
A–D CONTROL LATCHES M11 & M12
DELAY COUNTERS M13 & M14
BUFFERS M10
BUFFERS M24 & M25
PROCESSOR TRIGGER
EXTERNAL TRIGGER
INTERNAL TRIGGER
TRIGGER CONTROL
DELAY TIMER
TIMER
INTERRUPT & RUN/CAL MESSAGES
PRIMARY & SECONDARY COUNTERS M23
PROCESSOR ADDRESS BUS
800 kHz CLOCK
DATA READY LATCH
A–D SEQUENCE CONTROLLER M47/M46
NULL DETECT LATCH
ANALOG A–D CONTROL
Null Detect
A B C
To DC Isolator

FIG. 3.40 SIMPLIFIED DIAGRAM OF DIGITAL SECTION OF A–D CONVERTER

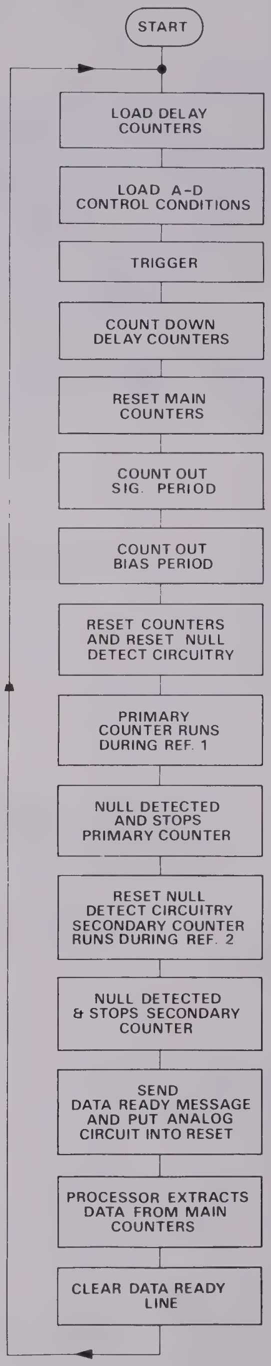

START
LOAD DELAY COUNTERS
LOAD A-D CONTROL CONDITIONS
TRIGGER
COUNT DOWN DELAY COUNTERS
RESET MAIN COUNTERS
COUNT OUT SIG. PERIOD
COUNT OUT BIAS PERIOD
RESET COUNTERS AND RESET NULL DETECT CIRCUITRY
PRIMARY COUNTER RUNS DURING REF. 1
NULL DETECTED AND STOPS PRIMARY COUNTER
RESET NULL DETECT CIRCUITRY SECONDARY COUNTER RUNS DURING REF. 2
NULL DETECTED & STOPS SECONDARY COUNTER
SEND DATA READY MESSAGE AND PUT ANALOG CIRCUIT INTO RESET
PROCESSOR EXTRACTS DATA FROM MAIN COUNTERS
CLEAR DATA READY LINE

FIG. 3.41 FLOWCHART OF A–D DIGITAL SECTION

SIGNAL	$\overline{A}$	$\overline{B}$	$\overline{C}$
RESET	1	1	0
SYNC	1	1	0
SIG	1	1	1
BIAS	0	1	1
WAIT	0	1	1
REF 1	1	0	1
REF 2	0	0	1
END	1	1	1

FIG. 3.42 A-D ANALOG SEQUENCE CONTROL SIGNALS

FUNCTION	1061 COUNT	
	$\overline{\text{FILTER}}$	FILTER
DC Volts	2	101
AC Volts	46	151
DC + AC Volts	46	151
Ohms	$2^{(1)}$	$101^{(1)}$
DC Current	$2^{(2)}$	101
AC Current	46	151
DC + AC Current	46	151

(1) 1MΩ Range $\overline{\text{FILTER}}$: 4, FILTER : 121
10MΩ Range $\overline{\text{FILTER}}$: 31, FILTER : 251

(2) 10mA Range : 3
100mA Range : 5
1A Range : 6

FIG. 3.43 COMMAND DELAYS

3.8.3.3 A-D Measurement Sequence

Trigger. The trigger, required to initiate the measurement sequence, is generated from one of three possible sources:

1. Internally generated 3/second trigger, from timer M61-7.
2. Externally generated trigger, from EXT TRIG on rear panel via M24-13.
3. A MPU derived trigger from M11-3 generated when auto-ranging, pressing MANUAL when HOLD selected, during calibration, an INPUT ZERO sequence or via the digital interface.

The trigger source is selected by the latched data on M12, enabling one of the three gates of M2.

Delay. The trigger pulse clocks the 'command latch' M1 causing the timer, M15, to output clock pulses (200Hz) to the delay counters (M13 and M14) after a delay of approx. 1.5mS set by C5, R8, R9, R11. The delay counters proceed to count down to zero, at which time the delay latch (M26) is clocked. Thus M26-14 becomes a logic '1', enabling the sequencer M47 (an octal counter) to proceed on to the next step via M46-2.

SYNC. The SYNC phase from the sequencer resets the counters of M23 and places the analog section of the A-D into SIG. The pulse is fed back to M47 via M46-3 to step on the sequencer.

SIG. During the time the SIG line is high (M47-3), the primary counter in M23 is enabled and counts out the signal period (2.5mS superfast or 20mS normal mode). At the end of this period, M23-23 goes high and passes via M46-10 enabling the sequencer to step on once again.

BIAS. The BIAS signal (M47-7) is transferred to the analog section of the A-D by changing the state of the $\overline{A}$ line (M38-9 to a logic '0'). BIAS also enables the secondary counter of M23 to count out the BIAS period (20μS). The signal indicating the end of this period is passed via M46-9 causing the sequencer to carry on to the next step. The BIAS signal also resets the 'delay latch' (M26) ready for the next measurement cycle, and the 'null detector' latch (M22A).

WAIT. The WAIT pulse resets the counter of M23 via M39-10, keeps the $\overline{A}$ line to the analog section low, clocks the polarity null detect latch M22(B) causing a logic '1' on pin 1 if the signal applied to the analog section of the A-D converter was positive (logic '0' if negative) and is fed back to enable the sequencer via M46-3.

REF 1. The high to low edge of WAIT causes the $\overline{A}$ to change state and going into REF 1 makes $\overline{B}$ a logic '0'. The analog side is then in the condition to start 'ramping down'. While REF 1 is high the primary counter of M23 is enabled (pin 3) and counts the period of REF 1.

REF 1 is ended when a null detector pulse is detected and latched on to M22. This causes the sequencer to step on once more from M46-3, the low to high edge from pin 4 disabling the primary counter.

REF 2. The REF 2 signal changes the state of the $\overline{A}$ line (causing the analog section to ramp down at a slower rate), reset the 'null detect' latch and enable the secondary counter of M23 (Pin 13) to count the period of REF 2. If the secondary counter overflows the primary counter is incremented from M26-16.

As in REF 1, a null detector pulse causes the counting period to end (M26-13) and increment the sequencer via M46-3 causing the $\overline{A}$ and $\overline{B}$ lines to change state.

END. The low to high edge from M47-10 is fed back to M47, via M48-6 giving a master reset. Thus the sequencer is placed into RESET.

RESET. The sequence pulse from M47-2 clocks the 'data ready' latch M1-3 placing a signal on to the CMOS Data Bus via tri-state buffer M10 indicating to the MPU that a reading is ready to be taken from the main counter M23. Data is extracted from the counters in three bytes (controlled by the A1 and A0 lines of the processor address bus) with the counter output buffers, M24 and M25 being enabled by $\overline{\text{XADDT}}$, a decoded processor address.

The RESET signal is also passed to the analog section of the A-D by changing the state of the C line.

Once the data has been extracted from the main counter the set-up procedure is then repeated to await a further trigger.

3.8.3.4 Master Clock and Line Locking (430329 sheet 4)

To give improved rejection of line frequency related noise, the 1061 is linelocked. The line frequency is sampled and compared to the internal master clock. Synchronisation is achieved by adjusting the master clock frequency.

A sinusoidal line frequency signal from the 5V mains tap is converted to a square-wave (M25-13) and ÷2(M26-1) before being fed to the comparator section of the ULA M23 (sheet 3). The MASTER CLOCK ÷2 signal is fed to ripple counter M27 which outputs a signal of twice the estimated line frequency, for line related periods, controlled by the ULA (M23-18). This signal is fed to M23-19 (via inverter M39) and after a further ÷2, is compared with the actual line frequency (see Fig 3.44).

The ULA determines whether the master clock is running too slow or too fast, producing a signal on pin 20 whose pulse-width is proportional to the difference. The output of pin 21 is a 25Hz square-wave which is fed to the up/down input of counters M41/50. Thus depending on the position and down period of the pulse, the count held is increased or decreased.

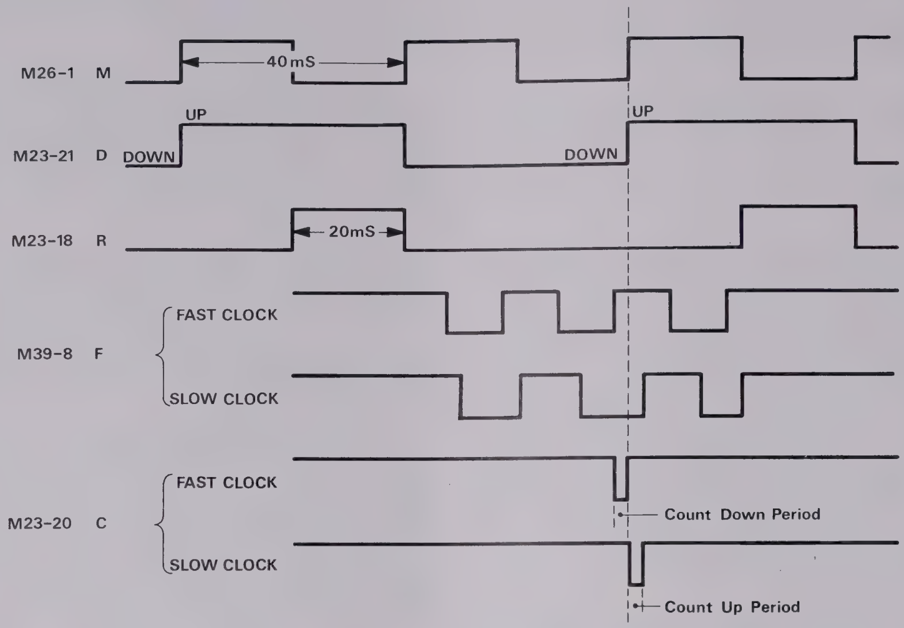


FIG. 3.44 LINE LOCKING TIMING DIAGRAM (50Hz)

Latches M42/51 are updated with this new count during the A-D RESET period and applies the count to resistor network AN4 which forms a D-A converter. Changing the voltage applied to varicap D9 alters its capacitance, thus adjusting the LC of the Colpitts oscillator. Therefore the frequency of the Master Clock is increased or decreased to be an exact multiple of the mains frequency.

3.9 FRONT PCB ASSEMBLY (Circuit Drawing No. 430294)

The Front pcb assembly accepts the measurement signals, digitally displays the value, provides manual control of the measurement circuits and data conditioning, and gives a visual status indication of the selectable instrument states.

3.9.1 Analog Input Signals (430294 sheet 2)

Signals applied to the front panel input terminals are routed directly to the rear panel board by two cables. The first takes the Hi and I+ lines and the second takes the lines Lo, I– and Ω's Guard. Both cables are screened by front panel Guard.

The front panel printed circuit board connects the front panel signal input terminals to the 2-4 wire and Local-Remote switches. Thus I+ and I– are wired to the 2-4 wire switch through thermistors R1 and R2 for connections to Hi and Lo if required. Similarly Ω's Guard and Guard may be shorted via the Local/Remote switch.

3.9.2 Display Signals (430294 sheet 1)

The front panel assembly routes the display signals from the Display Driver board to the gas discharge display.

3.9.3 Keyboard Data Encode (430294 sheet 1)

Selection of a front panel keyswitch causes one of the two 16-key encoders (M7 or M10) to send a data available message to M2 (a data latch) and to remember which key was pressed. The output of M2, (pin 1 or 13) signals the interrupt circuitry of the Digital Board (IRQK1 or IRQK2).

When the microprocessor accepts the interrupt and has located the source, the XKY BRD line to pin 13 of M7 and M10 is taken low, enabling the data outputs of the encoders to be placed on to the CMOS data bus (See Fig. 3.45 for the key select coding). This signal also resets M2 ready for the next key selection.

KEY	M7			
	14	15	16	17
	CD7	CD6	CD5	CD4
100	0	0	0	0
10	0	0	0	1
1000	0	0	1	0
10MΩ	0	0	1	1
1	0	1	0	0
.1	0	1	0	1
10Ω	0	1	1	0
AUTO	0	1	1	1
DC	1	0	0	0
kΩ	1	0	0	1
KEYBOARD	1	1	0	1
I	1	1	1	0
INPUT ZERO	1	1	1	1

KEY	M10			
	14	15	16	17
	CD3	CD2	CD1	CD0
HOLD	0	0	0	0
RATIO	0	0	0	1
TEST	0	0	1	0
ERROR	0	0	1	1
(A–B)	0	1	0	0
Av	0	1	0	1
÷ C	0	1	1	0
MAX	0	1	1	1
MIN	1	0	0	0
RESET	1	0	0	1
MAN	1	0	1	0
INPUT FILTER	1	1	0	1
AC	1	1	1	1

FIG. 3.45 CMOS DATA BUS : KEY SELECT CODING

3.9.4 Keyboard L.E.D. Data Decode (430294 sheet 1)

The XKY BRD signal is inverted by Q1, R7, C1, R6 partially enabling the L.E.D. data latches M4, M5, M6, M8, M9, M11 and M12 while information is not being extracted from the keyboard encoders. The data latches are divided into four sets, M6 and M4, M8 and M5, M12 and M11, M9 being fully enabled from the XKD SP0 – XKD SP3 lines respectively.

On initialisation or after a change of the instrument's selectable states, the L.E.D. data latches are updated by placing data on the CMOS Data Bus (See Fig. 3.46), firstly to M8 and M5 (enabled from XKD SP1) and 'clocking' from the CMOS CLK line (J2-6), secondly to M12 and M11, then M9 and finally M6 and M4.

The output of the L.E.D. latches provide the signals to the bases of the L.E.D. drive transistors, switching them on or off as required.

CMOS DATA LINE	M12/M11	M8/M5	M6/M4	M9
CD0	÷C	DC	AUTO	
CD1	Av	kΩ	10Ω	
CD2	ERROR	INPUT ZERO	.1	
CD3	TEST	INPUT FILTER	1	
CD4	A–B	KEYBOARD	10	
CD5	MIN		100	MAN
CD6	MAX	I	1000	RATIO
CD7	RESET	AC	10MΩ	HOLD

FIG. 3.46 CMOS DATA BUS : LED-SELECT CODING

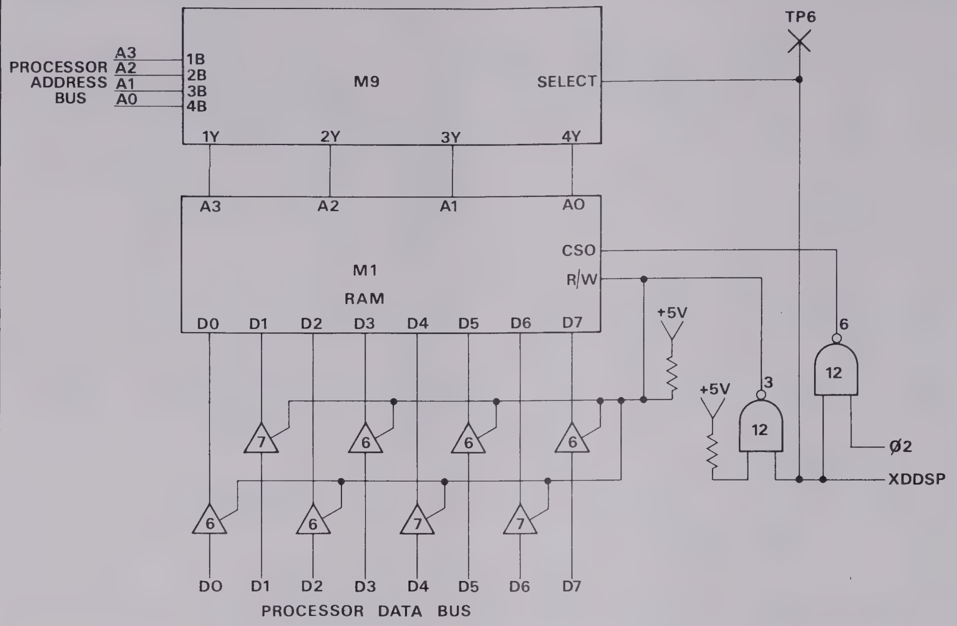

TP6
PROCESSOR ADDRESS BUS
A3
A2
A1
A0
1B
2B
3B
4B
M9
SELECT
1Y
2Y
3Y
4Y
A3
A2
A1
AO
CSO
M1
RAM
R/W
D0
D1
D2
D3
D4
D5
D6
D7
+5V
+5V
3
6
12
12
7
6
6
6
6
6
7
7
Ø2
XDDSP
DO
D1
D2
D3
D4
D5
D6
D7
PROCESSOR DATA BUS

FIG. 3.47 DISPLAY DRIVER WRITE CIRCUITRY

COUNTER (M8)				RAM (M1)				Display block energised or operation implemented from M11
Q_3	Q_2	Q_1	Q_0	A_3	A_2	A_1	A_0	
0	0	0	0	0	0	0	0	1
0	0	0	1	0	0	1	0	3
0	0	1	0	0	1	0	0	5
0	0	1	1	0	1	1	0	7
0	1	0	0	1	0	0	0	9
0	1	0	1	1	0	1	0	11
0	1	1	0	1	1	0	0	
0	1	1	1	1	1	1	0	
1	0	0	0	0	0	0	1	2
1	0	0	1	0	0	1	1	4
1	0	1	0	0	1	0	1	6
1	0	1	1	0	1	1	1	8
1	1	0	0	1	0	0	1	10
1	1	0	1	1	0	1	1	Reset Counter

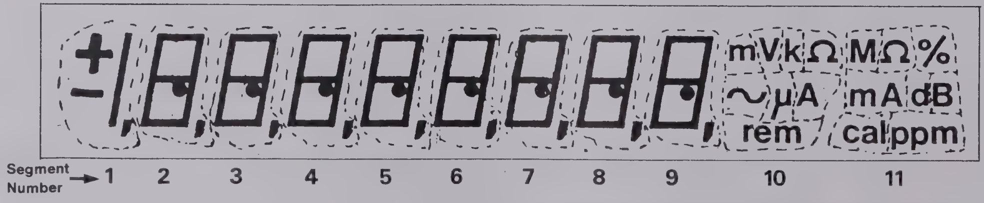

±
mVkΩ
MΩ%
~μA
mAdB
rem
calppm
Segment Number →
1
2
3
4
5
6
7
8
9
10
11

FIG. 3.48 DISPLAY DRIVER READ MODE ADDRESS STATES

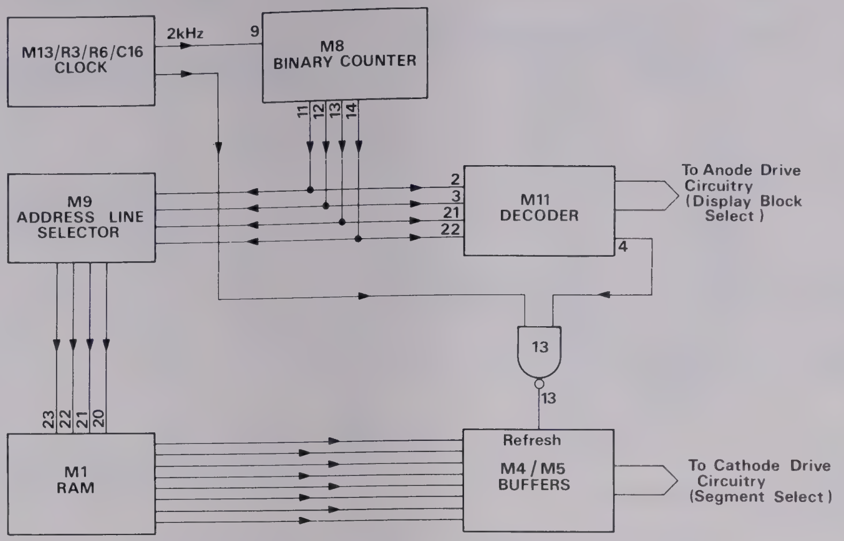


FIG. 3.49 SIMPLIFIED DISPLAY DRIVER READ CIRCUITRY

3.10 DISPLAY DRIVER ASSEMBLY (Circuit Drawing No. 430330).

Basically, the Display Driver assembly receives the display information from the microprocessor (running at 800kHz) and stores it in a Random Access Memory (RAM) digit by digit. This data is then read out at a slower frequency (2kHz), level shifted and output to the gas discharge display.

NOTE: In the following description, each bar, decimal point or legend is referred to as a display segment and each set of segments i.e. ±1, 8 or a legend block, is referred to as a display block.

3.10.1 Write Mode

On completion of a reading or when certain modes are selected, (e.g. ERROR, keyboard entry), the processor indicates to the Display Driver Board that data is ready to be transferred by the signal XDDSP (TP6). This causes the RAM (M1) to be placed into its write mode and the quadruple 2-line to 1-line data selector, M9, to select the 'B' inputs which are connected to the processor address bus.

The signal XDDSP also causes the tri-state buffers M6 and M7 to become enabled, causing the data input lines of the RAM to be connected to the processor data bus. Thus under MPU control, the display data (±1, 8 's, decimal points and legends) is written into the RAM.

Once this transfer of data is complete the RAM becomes deselected, the buffers return to their third state inhibiting the data bus to the RAM and connects the 'A' inputs of M9 to the address lines of the RAM.

3.10.2 Read Mode

Discharge between adjacent display blocks is prevented by time multiplexing and sending information to alternate blocks. A particular display block is selected by driving the anodes, and a particular segment by driving the cathode.

The free running clock M13, R3, R6, C16, produces a 2kHz signal (M13-9) to drive a 4-bit binary counter, M8, which provides the control of the address lines in the read mode (See Fig. 3.49). The display block selection is achieved by decoding these 4 lines into 16 bits using M11. The output lines of M11 are connected to the bases of transistors Q1-Q3, Q13-Q20 which act as anode switches. Note that when the address lines are in the state 0000 the output of M11 (pin 11) selects the anode to block 1, 0001 selects the anode to block 3 (M11-9), 0010 ... block 5, etc., thus the display blocks are selected alternately.

To select the appropriate segment data from the RAM to match the display block selection the address lines are given a left hand bit rotation, i.e. if the output of M8 is labelled DCBA, (2^3, 2^2, 2^1, 2^0), the address input of M1 would be CBAD. (Fig. 3.48 gives the state of the address lines for each display block). The particular display block segment data is recalled by the RAM, buffered by M4 and M5, level shifted −180 volts by R8-R15, C4-C11 causing Q5-Q12 to drive the cathodes, D1-D10 acting as restoration diodes. Between the transfer of each set of segment data, M13-3 is taken high, causing the outputs of M4 and M5 to be a logic '0'. This produces a refresh period for capacitors C4-C11 to discharge from the −180V supply through the restoration diodes.

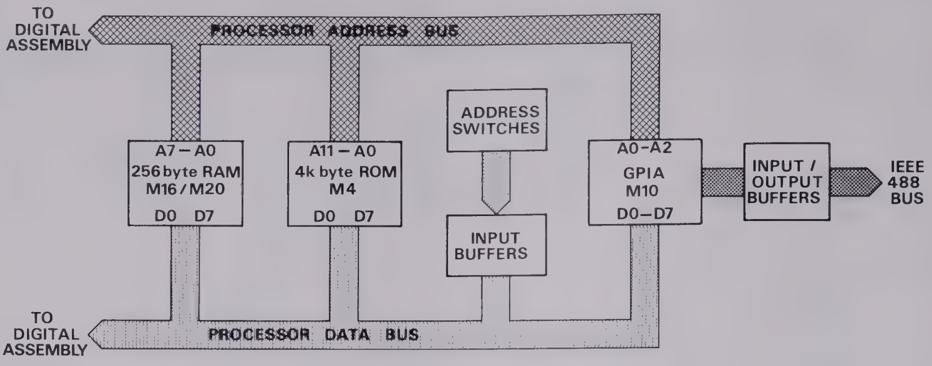

TO DIGITAL ASSEMBLY
PROCESSOR ADDRESS BUS
ADDRESS SWITCHES
A7 – A0
256 byte RAM
M16 / M20
D0 D7
A11 – A0
4k byte ROM
M4
D0 D7
A0–A2
GPIA
M10
D0–D7
INPUT / OUTPUT BUFFERS
IEEE 488 BUS
INPUT BUFFERS
TO DIGITAL ASSEMBLY
PROCESSOR DATA BUS

FIG. 3.50 SIMPLIFIED DIAGRAM OF IEEE ASSEMBLY

3.11 IEEE DIGITAL INTERFACE (Circuit Drawing No. 430306)

The IEEE Digital Interface assembly contains the extra memory and circuitry required for the execution and decoding of interface functions, and to perform data input/output transfers. Simplified diagram Fig. 3.50 shows the essential features of this board.

3.11.1 RAM/ROM Circuit

The IEEE Digital Interface assembly acts as an extension to the Digital assembly with connections to both the Processor Address and Data Buses. The board contains 4k bytes of program memory (M4) containing the subroutines to control the instrument from the IEEE 488 Bus. Extra 'Operating ('scratch pad') Memory' is provided by two 256 x 4 bit RAMS (M16, M20). Both the ROM and the RAM's receive the address information, with chip selection being made by decoding address lines A3-A11 with XIOBD.

3.11.2 Interface Circuit

The General Purpose Interface Adapter (GPIA). M10, provides the interface between the IEEE 488 Standard Instrument Bus and the 6800 microprocessor. The MPU can receive, process and send messages to the interface through the GPIA.

The GPIA is able to automatically handle the following interface protocol[1] :–

Single address capability
Source and acceptor handshake
Talker and Listener states
Service Request
Parallel Poll
Device Clear
Device Trigger

With the MPU it is also capable of:–
Programmable Interrupts
Storing the instrument's address
Control of the interface input/output buffers.

The GPIA is selected by decoding address lines A3-A11 with $\overline{\text{XIOBD}}$. Address lines A0-A2 with the state of the MPU R/$\overline{\text{W}}$ line select one of the 8 read-only or 7 write-only registers in the GPIA, enabling the MPU to send or receive data over the interface.

The two signals T/$\overline{\text{R}}$1 and T/$\overline{\text{R}}$2 are used to control low power transceivers (formed from M1, 2, 5, 6, 8, 9, 11, 12, 13) which drive the interface bus.

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[1] For further information refer to 'Getting aboard the 488 Bus' published by Motorola.

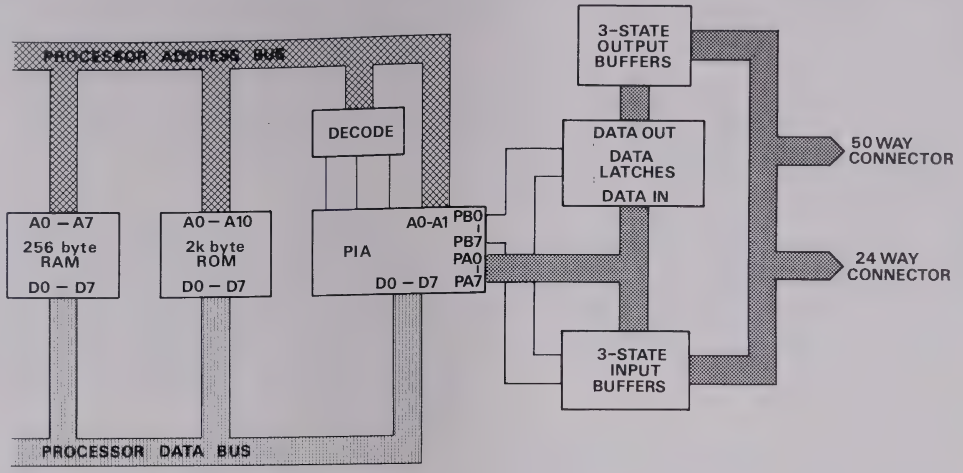
PROCESSOR ADDRESS BUS
PROCESSOR DATA BUS
A0 – A7
256 byte RAM
D0 – D7
A0 – A10
2k byte ROM
D0 – D7
DECODE
PIA
A0-A1
D0 – D7
PB0
PB7
PA0
PA7
3-STATE OUTPUT BUFFERS
DATA OUT
DATA LATCHES
DATA IN
3-STATE INPUT BUFFERS
50 WAY CONNECTOR
24 WAY CONNECTOR

FIG. 3.51 SIMPLIFIED DIAGRAM OF BCD INTERFACE ASSEMBLY

3.12 BCD DIGITAL INTERFACE (Circuit Drawing No 430332)

The BCD Digital Interface assembly contains the extra memory and circuitry required for the execution and decoding of interface functions and to perform data output transfers. Simplified diagram, Fig 3.51 shows the essential features of this board.

3.12.1 RAM/ROM Circuit

The BCD Digital Interface assembly acts as an extension to the Digital assembly with connections to both the Processor Address and Data Buses. The board contains 2k bytes of program memory (M11) containing the sub-routines to control the instrument from the BCD Interface. Extra 'operating (scratch pad) memory' is provided by two 256x4 bit RAMS (M22, M23). Both the ROM and RAM's receive the address information, with chip selection being made by decoding address lines A8-A11 with XIOBD, R/$\overline{W}$ and Ø2.

3.12.2 Interface Circuit

The Peripheral Interface Adapter (PIA), M1, provides the means of interfacing the BCD input/output to the 6800 microprocessor. The PIA is selected by decoding address lines A9-A11 with XIOBD. Address lines A0 and A1 together with MPU data messages configure the six internal registers controlling data flow and external control signals.

Peripheral Data lines PBO-PB7 (M1 pins 10-17) are used as enable lines allowing data to be placed on the BCD Data Bus from the Remote Programming Input and control lines of the BCD Output (2 bytes) and allowing data to be placed into output latches M7-M10, M12-M16 (5 bytes).

The length of PRINT COMMAND is controlled by the timer M2, R1, C3.

3.13 REAR (POWER SUPPLY) PCB ASSEMBLY (Circuit Drawing No. 430295)

3.13.1 General

The line transformer and power supply components are situated at the rear right hand side of the instrument, when viewed from the front. Transformers T1 and T2 are of toroidal construction mounted one on top of the other and bolted to the rear panel. T1 has a split primary comprising two 115V windings, intended for either series or parallel connection depending on the line voltage. An earth screen is interposed between primary and secondary windings to minimise electrostatic coupling, and is grounded to line earth. The second transformer T2 is driven from T1. It also possesses an electrostatic screen, this time being connected to Guard.

3.13.2 180V Supply

The 180V supply is required for the gas discharge display. Bridge rectifier W1 and C6 convert the 200V AC from the secondary of T1, to DC. R6, D3, D3, R4 and Q2 act as a constant current source being regulated by D4, R5 and Q1. The +5V line (TP2) is connected to the digital +5V line (TP3) on the Display Driver assembly.

3.13.3 5V Supply

All the logic circuitry to the right of the central printed circuit board is powered from the supply generated from the two 8.8 volt 750mA secondary windings on transformer T1. The centre tap (digital common) is referenced to line earth via a 100kΩ resistor, R1 in parallel with a 100nF capacitor, C1. The output of rectifying diodes D1 and D2 is smoothed by C7 and C8 before being fed to regulator M1. This regulator is capable of 1 amp output and has foldback current limiting and thermal shut-down, to provide short circuit protection.

3.13.4 ±15V Supply

The output of the third secondary winding of transformer T1 (10V AC) is input to the primary of T2. The two 19.25V outputs are connected in series, with the centre tap connected to analog common. The output of bridge rectifier W2 is fed to voltage regulators M2 and M3 (wired in series), to produce positive and negative 15 volt supplies to power the analog circuitry. These regulators also include foldback current limiting and thermal shut-down, to provide short-circuit protection.

3.14 SELF TEST SEQUENCE

Selection of the TEST key places the instrument into a test routine, checking the display and basic measuring circuits. A flowchart for the routine is given in Fig. 3.53. The analog circuitry conditions for each test are given in the last subsection of the circuit description for the particular board, and the range 'F.E.T.' patterns in Appendix I-8.

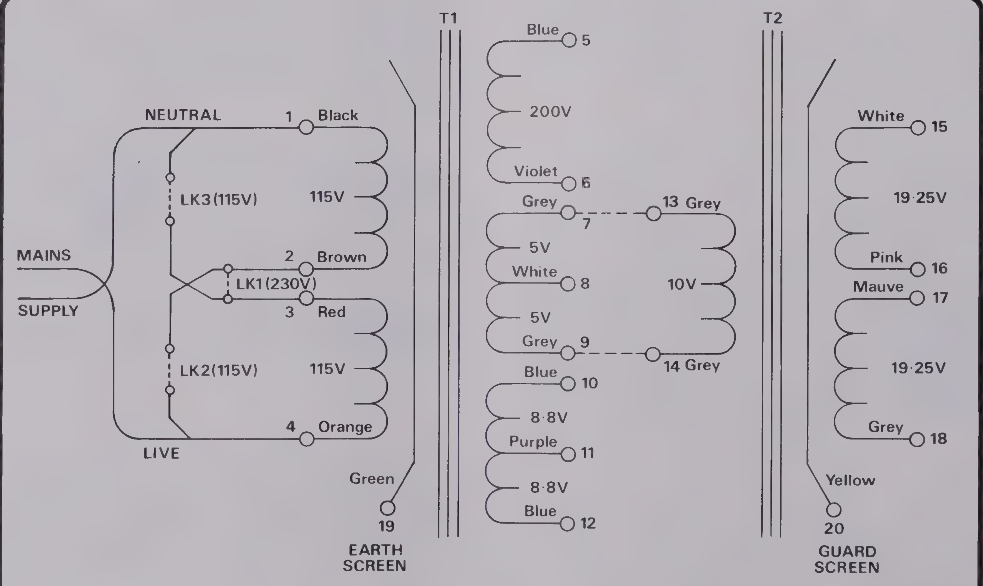
T1
T2
Blue 5
200V
Violet 6
Grey 7
13 Grey
5V
White 8
10V
5V
Grey 9
14 Grey
Blue 10
8·8V
Purple 11
8·8V
Blue 12
NEUTRAL
1 Black
LK3(115V)
115V
MAINS
SUPPLY
2 Brown
LK1(230V)
3 Red
LK2(115V)
115V
4 Orange
LIVE
Green
19
EARTH SCREEN
White 15
19·25V
Pink 16
Mauve 17
19·25V
Grey 18
Yellow
20
GUARD SCREEN

FIG. 3.52 LINE TRANSFORMER

3.13 REAR (POWER SUPPLY) PCB ASSEMBLY (Circuit Drawing No. 430295)

3.13.1 General

The line transformer and power supply components are situated at the rear right hand side of the instrument, when viewed from the front. Transformers T1 and T2 are of toroidal construction mounted one on top of the other and bolted to the rear panel. T1 has a split primary comprising two 115V windings, intended for either series or parallel connection depending on the line voltage. An earth screen is interposed between primary and secondary windings to minimise electrostatic coupling, and is grounded to line earth. The second transformer T2 is driven from T1. It also possesses an electrostatic screen, this time being connected to Guard.

3.13.2 180V Supply

The 180V supply is required for the gas discharge display. Bridge rectifier W1 and C6 convert the 200V AC from the secondary of T1, to DC. R6, D3, D3, R4 and Q2 act as a constant current source being regulated by D4, R5 and Q1. The +5V line (TP2) is connected to the digital +5V line (TP3) on the Display Driver assembly.

3.13.3 5V Supply

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3.13.4 ±15V Supply

The output of the third secondary winding of transformer T1 (10V AC) is input to the primary of T2. The two 19.25V outputs are connected in series, with the centre tap connected to analog common. The output of bridge rectifier W2 is fed to voltage regulators M2 and M3 (wired in series), to produce positive and negative 15 volt supplies to power the analog circuitry. These regulators also include foldback current limiting and thermal shut-down, to provide short-circuit protection.

3.14 SELF TEST SEQUENCE

Selection of the TEST key places the instrument into a test routine, checking the display and basic measuring circuits. A flowchart for the routine is given in Fig. 3.53. The analog circuitry conditions for each test are given in the last subsection of the circuit description for the particular board, and the range 'F.E.T.' patterns in Appendix I-8.

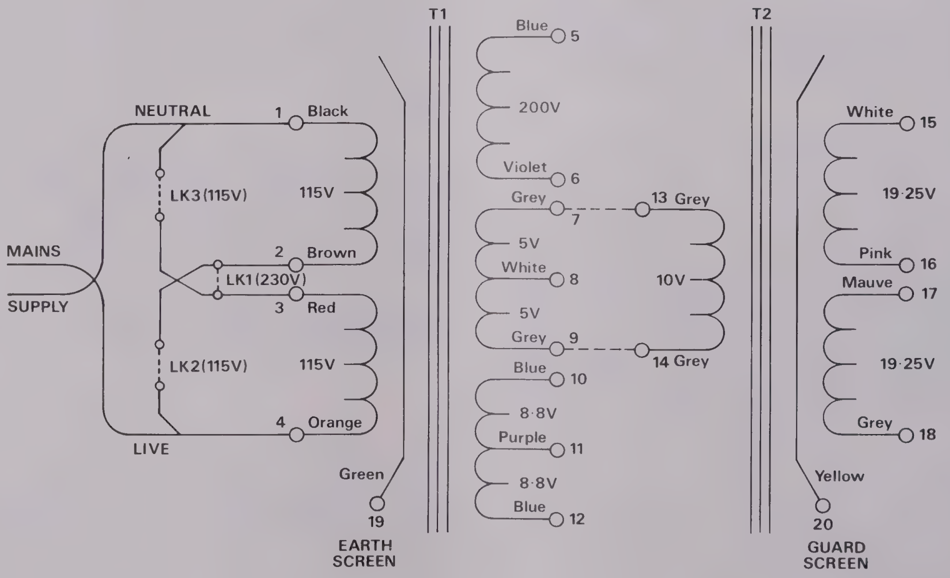
T1
T2
Blue 5
200V
Violet 6
Grey 7
13 Grey
5V
White 8
10V
5V
Grey 9
14 Grey
Blue 10
8·8V
Purple 11
8·8V
Blue 12
NEUTRAL
1 Black
LK3(115V)
115V
MAINS
SUPPLY
2 Brown
LK1(230V)
3 Red
LK2(115V)
115V
4 Orange
LIVE
Green
19
EARTH SCREEN
White 15
19·25V
Pink 16
Mauve 17
19·25V
Grey 18
Yellow
20
GUARD SCREEN

FIG. 3.52 LINE TRANSFORMER

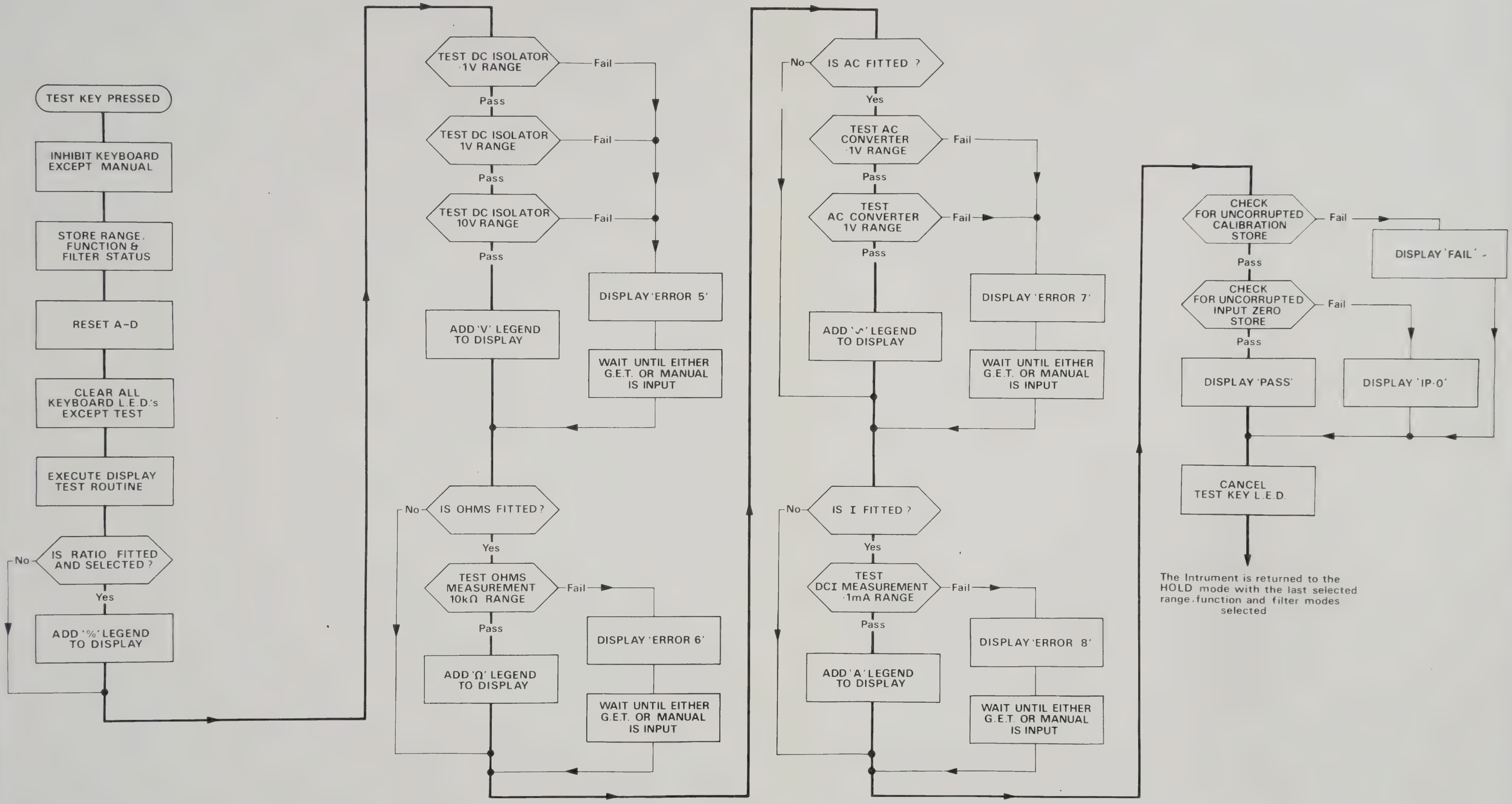
TEST KEY PRESSED
INHIBIT KEYBOARD EXCEPT MANUAL
STORE RANGE, FUNCTION & FILTER STATUS
RESET A-D
CLEAR ALL KEYBOARD L.E.D.'s EXCEPT TEST
EXECUTE DISPLAY TEST ROUTINE
IS RATIO FITTED AND SELECTED ?
No
Yes
ADD '%' LEGEND TO DISPLAY
TEST DC ISOLATOR ·1V RANGE
Fail
Pass
TEST DC ISOLATOR 1V RANGE
Fail
Pass
TEST DC ISOLATOR 10V RANGE
Fail
Pass
DISPLAY 'ERROR 5'
ADD 'V' LEGEND TO DISPLAY
WAIT UNTIL EITHER G.E.T. OR MANUAL IS INPUT
IS OHMS FITTED ?
No
Yes
TEST OHMS MEASUREMENT 10kΩ RANGE
Fail
Pass
DISPLAY 'ERROR 6'
ADD 'Ω' LEGEND TO DISPLAY
WAIT UNTIL EITHER G.E.T. OR MANUAL IS INPUT
IS AC FITTED ?
No
Yes
TEST AC CONVERTER ·1V RANGE
Fail
Pass
TEST AC CONVERTER 1V RANGE
Fail
Pass
DISPLAY 'ERROR 7'
ADD '∿' LEGEND TO DISPLAY
WAIT UNTIL EITHER G.E.T. OR MANUAL IS INPUT
IS I FITTED ?
No
Yes
TEST DCI MEASUREMENT ·1mA RANGE
Fail
Pass
DISPLAY 'ERROR 8'
ADD 'A' LEGEND TO DISPLAY
WAIT UNTIL EITHER G.E.T. OR MANUAL IS INPUT
CHECK FOR UNCORRUPTED CALIBRATION STORE
Fail
Pass
DISPLAY 'FAIL'
CHECK FOR UNCORRUPTED INPUT ZERO STORE
Fail
Pass
DISPLAY 'PASS'
DISPLAY 'IP·0'
CANCEL TEST KEY L.E.D.
The Intrument is returned to the HOLD mode with the last selected range, function and filter modes selected

FIG. 3.53 FLOWCHART OF SELF-TEST ROUTINE

SECTION 4

INTERNAL ADJUSTMENT PROCEDURES

4.1 ALTERATION OF LINE VOLTAGE AND LINE FREQUENCY

The instrument is set to 50Hz, 205V to 255V supplies unless Option 80, 81 or 82 is specified. This information is carried on the instrument identification label located on the rear panel. Alteration to a different line voltage/line frequency may necessitate an instrument recalibration.

4.1.1 Changing Line Voltage

1. Disconnect power and all signal input/output leads.
2. Remove the lower cover.
3. Locate the link(s) connecting the split primary on the printed circuit board in front of the toroidal line transformer, Fig. 2.1 and Drawing No 400295.
4. 115V Operation:— Remove LK1 (link 1) and fit LK2 and LK3[1].
   230V Operation:— Remove links LK2 and LK3, and fit LK1[1].
5. Amend instrument identification label.
6. Replace lower cover.
7. Replace power fuses with 160mA anti-surge (230V) or 500mA anti-surge (115V).
8. Carry out the Specification Verification tests (Section 8, User's Handbook) and recalibrate if necessary.

4.1.2 Changing Line Frequency

1. Disconnect power and all signal input/output leads.
2. Remove the top cover.
3. 400Hz Operation:— Remove link LK5 and fit LK7[1] on the Digital assembly, (Drawing No. 400329).
   50/60Hz Operation:— remove link LK7 and fit LK5[1] on the Digital assembly (Drawing No. 400329).
4. Place instrument into HOLD. Adjust L2 (Digital assembly) so that TP7 is 1.05V ±0.03V with respect to Digital Common (TP28).

NOTE: This signal contains about 200mV peak-to-peak high frequency noise.

5. Amend instrument identification label.
6. Replace the top cover.
7. Carry out the Specification Verification tests (Section 8, User's Handbook) and recalibrate if necessary.

4.2 BATTERY REPLACEMENT

The battery should be replaced on or before the date indicated on the rear panel instrument identification label. To retain the calibration memory, the instrument must be powered-up during replacement. Therefore great care must be taken due to voltages up to 260 volts being present inside the instrument.

1. Remove top cover and locate battery on the Digital assembly (see Fig. 2.1).
2. Power-up instrument.
3. Desolder battery at end of tags and remove from clip.
4. Replace with new battery, (Datron Part No. 920049) positive terminal to resistor.
5. Replace top cover.
6. Amend instrument identification label (Current date + 5 years).
7. Carry out the Specification Verification tests (Section 8, User's Handbook) and recalibrate if necessary.

4.3 POST-REPAIR PROCEDURES

Apart from the RMS Module (which is available only from Datron), all integrated circuits and semiconductor devices are standard manufacturers' products, and special selection is unnecessary. During manufacture certain resistors are selected in value (FSV = Factory Selected Value) to accommodate circuit component tolerances, or to bring the desired setting of a preset control to the middle of its adjustment range.

The thermal tracking of the DC Preamplifier is particularly important, to ensure a low order of zero drift with variations of temperature. This rather time consuming procedure is carried out initially during manufacture, and need only be repeated following replacement of Q12 or any component associated with the temperature compensation circuitry.

NOTE: A routine calibration as detailed in Section 1 should be carried out after completion of the following procedures.

CAUTION : Up to 260 volts is present inside the instrument. Personal contact with these points may result in injury.

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[1] Links should be 22 SWG TIN.Cu wire with silicone rubber sleeving.

4.3.1 Basic DC Instrument

Equipment Requirements:

4½ digit Digital Voltmeter e.g. Datron 1041
Variable 5V, 1 amp DC supply
5mV/division Oscilloscope e.g. Telequipment D83
1MΩ5% resistor in parallel with 10nF capacitor
10MΩ5% resistor in parallel with 10nF capacitor
DC Voltage Calibrator, e.g. Fluke 332D with correction figures.

Procedure:

Power Supplies

1. Turn instrument on and allow 5 minutes warm-up period.

2. Connect DVM Hi to TP8 and Lo to TP28 on the Digital assembly. Adjust R2 on the Rear (Power Supply) pcb assembly to give +5.100V ±25mV.

3. Connect DVM Hi to TP1 and Lo to TP20 on the Analog assembly. Adjust R7 on the Rear (Power Supply) pcb assembly to give +15.000V ±15mV.

4. Connect DVM Hi to TP2 and Lo to TP20 on the Analog assembly. Adjust R12 on the Rear (Power Supply) pcb assembly to give −15.000V ±15mV.

Digital Assembly

5. Switch the instrument off and disconnect the power lead.

6. Isolate the Digital Board by removing the connectors along the centre panel (J1-J5).

7. Connect variable 5V supply and DVM Hi's to TP8, Lo's to TP28. Reduce supply to 4.750V ±10mV.

8. Set R83 fully clockwise. Connect oscilloscope Lo to TP28 and monitor M53 pin 40. Turn R83 anti-clockwise until TP30 undergoes a high to low transition (or begins to pulse low).

9. Remove variable supply and reconnect items disconnected in steps 5 and 6. Disconnect the oscilloscope. Switch on the instrument.

10. Connect DVM Hi to battery positive terminal, Low to TP28. Check battery voltage is >2.5 volts.

11. Disconnect DVM and connect oscilloscope Hi to TP25, Lo to TP28. Adjust R11 to give a 6mS ±0.5mS period, mark-space ratio 3.5 : 1.5.
NOTE: This signal appears in short 'bursts' every reading.

12. Place instrument into HOLD. Connect oscilloscope Hi to TP7. Adjust L2 to give a stable +1.05 ±0.03V.
NOTE: This signal contains about 200mV peak to peak high frequency noise.

13. Insert calibration key into keyswitch on the back panel and turn, placing the instrument into CAL mode.
NOTE: The display CAL legend will be lit.

14. Short together pins 'D' and 'E' on Digital assembly.
NOTE: All the calibration store correction factors are now reset to zero.

15. Turn the calibration key back to RUN mode.

Analog Assembly (DC Isolator Section)

16. Centralize R150 and R160.

17. Select 0.1V range DC with FILTER out. Apply a 10MΩ resistor between instrument Hi and Lo. Connect DVM Hi to TP13, Lo to TP20.
Adjust FSV R152 with a metal film resistor (50ppm/°C) for a reading of $<$ 10mV, using R159 for 'fine' adjustments.
Do not solder in R152.

18. Apply a short circuit across the input terminals and adjust R150 for a reading of $<50\mu V$ at TP13.

19. Connect DVM Hi to TP33 and adjust R160 for a reading of $<20\mu V$.

20. Repeat steps 17 to 19 until readings are within specified limits.

NOTE: The following step is only required after the replacement of Q12 or any component associated with the temperature compensation circuitry.

21. (i) Re-apply 10MΩ resistor across the input terminals. Note the reading on the front panel display (=A).
    (ii) Note the ambient temperature (=X°C).
    (iii) Place the instrument in a temperature controlled oven at approx 50°C without top cover and with power 'on'.
    (iv) Leave the instrument for at least 1 hour then note the reading on the display (=B) and the temperature of the oven (=Y°C).
    (v) Compute (B–A)/(Y–X) = Drift/°C.
    (vi) Remove instrument from oven and allow to stabilize, with power 'on' to ambient for one hour.
    (vii) If the drift was <10 digits/°C proceed to (x).
    (viii) For drifts in excess of 10 digits/°C R151 must be adjusted. If the drift was positive turn R151 clockwise, if negative turn R151 anti-clockwise.
    (ix) Repeat from (i).
    (x) Lock R151 with a clean soldering iron.
    (xi) Repeat steps 17 to 20.

22. Solder in R152, with instrument turned off.

Analog Assembly (A-D Converter)

23. Select 100V range and apply short circuit between Hi and Lo. Connect DVM Hi to TP7, Lo to TP20. If reading is +6.42V ±0.03V proceed to step 25.

24. Switch off instrument and make positive reference links B & C, if cut i.e. the links alongside TP7. Switch on instrument and measure voltages on TP7 once again. Consult Fig. 4.1 and cut links as indicated. Repeat step 23.

Voltage on TP7 or TP8	TL'B'	TL'C'
6.42	–	–
6.47	–	✓
6.525	✓	–
6.58	✓	✓

Select voltage closest to measured value and cut links

FIG 4.1 REFERENCE SELECTION VOLTAGES

25. Connect DVM Hi to TP8. If reading is –6.42V ± 0.03V proceed to step 27.

26. Switch off instrument and make negative reference links A to C, if cut i.e. the links alongside TP8. Switch on instrument and measure voltage on TP8 once again. Consult Fig 4.1 and cut links as indicated. Repeat Step 25.

27. Select HOLD. Connect DVM Hi to TP9. Select correct resistance value for FSV R11 or R15 to give a reading of 0V ±1mV. Solder in resistor.

28. Deselect HOLD and disconnect DVM. Select 1000V range and apply +19mV. Connect oscilloscope Lo to TP21, Hi to TP5. Adjust R20 for noisy waveform at zero point.

29. Remove oscilloscope. Replace covers but do not replace screws. Select 1V, DC, filter out and apply 1MΩ across input terminals. Turn rear panel keyswitch to CAL mode and select LIN.

30. Select .1V range and apply 10MΩ across input terminals. Select Ib. Repeat until display reads less than 50 digits.

31. Select 10V range, FILTER and apply short copper link across input terminals. Select ZERO.

32. Apply +10 volts and select GAIN. Repeat until display reads +10.0000 ± ½ digit.

33. Apply +19 volts. If the display reads within the limits +18.9999 to +19.0001, proceed to step 35.

34. Calculate E = (19 – displayed reading)/2.
    Re-apply +10 volts and adjust R23 for a displayed reading of 10 – E.
    Repeat steps 32-34 until both readings are within the limits indicated.

35. Turn rear panel keyswitch to RUN mode.

The basic DC only instrument set-up procedure is complete.

4.3.2 Ohms Assembly

Equipment Required :

5½ digit Digital Voltmeter e.g. Datron 1051 or 1061.
10MΩ5% resistor in parallel with 10nF capacitor.
Copper shorting links.

Procedure

1. Centralize R26 and R27. Cut test links TL4 and TL5, and make TL6.

2. Select kΩ, 10kΩ range and set the instrument for 4-wire measurement on the front panel. Connect I– to Ω Guard, I+ to Hi and 10MΩ between Hi and Lo. Connect DVM Hi to TP4, Lo to TP1. Adjust R26 for zero ±300μV.

3. Remove 10MΩ resistor and replace with a short circuit. Connect DVM Hi to 'LO OUT' (J1-5) and adjust R27 for zero ± 2μV.

4. Repeat steps 2 and 3 until readings are within specified limits.

5. Connect Lo to Ω Guard with a short copper link.
   Connect shorting link between TP1 and TP7.
   Connect DVM Hi to TL6, Lo to TL1. If reading is <50μV proceed to step 6.
   Adjust FSV R40 if > +50μV or FSV R39 if < –50μV.

   NOTE: R39, R40 must be ⩾ 100kΩ.

6. Remove link between TP1 and TP7 and connections on front panel. Reconnect TL4 and TL5. Cut TL6.

The basic Ohms set-up procedure is complete.

4.3.3 AC Assembly

Equipment required:

4½ digit Digital Voltmeter e.g. Datron 1041.
5mV/division Oscilloscope e.g. Telequipment D83.
AC Calibrator e.g. Fluke 5200A.
5:1 asymmetric crest factor signal, 1 volt r.m.s., 0.02% accuracy.

Procedure

1. Select AC 1000V range and HOLD. Short Hi to Lo. Connect DVM Hi to TL7, Lo to TP8 and note reading. Select 1V range and adjust R121 (bias current) to give same reading ±10μV.

2. Select 100mV range, AC + DC and adjust R112 (offset adjust) for an indication of zero ±50μV on the DVM.

3. Repeat steps 1. and 2. until readings are within the specified limits.

4. Select 10V range and HOLD. Connect oscilloscope Hi to TP5, Lo to TP8 and adjust R90 (rectifier zero) for maximum noise about zero. Remove the oscilloscope.

5. Connect DVM Hi to TP2, Lo to TP8 and adjust R75 (linearity) for an indication on the DVM of 1.8mV ±10%.

6. Select AC, 1V range, FILTER and apply 1V 500Hz. Connect DVM Hi to TL5, Lo to TP8. If reading is +3.157V ±0.01V proceed to step 8.

7. Disconnect input signal and switch off instrument, Make links TL1 to TL4 if cut. Switch on instrument, reselect AC, 1V range, FILTER and reapply 1V, 500Hz. Measure voltage on TL5. Consult Fig. 4.2 and cut links as indicated. Check voltage on TL5 is 3.157V ±0.01V. Remove the DVM.

Voltage on TL5	TL1	TL2	TL3	TL4
3.157	–	–	–	–
3.178	–	–	–	✓
3.198	–	–	✓	–
3.218	–	–	✓	✓
3.239	–	✓	–	–
3.259	–	✓	–	✓
3.280	–	✓	✓	–
3.300	–	✓	✓	✓
3.320	✓	–	–	–
3.340	✓	–	–	✓
3.360	✓	–	✓	–
3.380	✓	–	✓	✓
3.400	✓	✓	–	–
3.420	✓	✓	–	✓
3.440	✓	✓	✓	–
3.460	✓	✓	✓	✓

Select voltage closest to measured value and cut links

FIG 4.2 AC BOARD OUTPUT SELECTION VOLTAGES

8. Deselect HOLD and short circuit instrument Hi and Lo. Turn rear panel key switch to CAL mode and select ZERO. Repeat for all ranges.

9. Select 1V range. Apply 1 volt (d.c.) and note reading on display. Apply −1 volt (d.c.) and adjust R50 (d.c. turnover) for same display indication ±10 digits.

10. This part of the procedure must be performed with the high frequency compensation voltage, at J1-11/R57, at −5V ±0.2V.

    a. Select AC 100V range, FILTER and apply 100V, 500Hz. Select GAIN. Apply 100V, 50kHz and adjust C62 for a display of 100.000V ±20 digits.

    b. Apply 100V, 100kHz note error and adjust C61 to double the displayed error in the same direction.

    c. Repeat a. and b. until 50kHz and 100kHz displays are within ±20 digits.

    d. Select 1V range and apply 1 volt, 500 Hz. Select GAIN. Apply 1V 50kHz and adjust C63 for a display of 1.00000V ±20 digits.

11. Apply 1 volt 5:1 crest factor signal. Adjust R35 (crest factor) for a display of 1.00000V ±30 digits.

12. Open circuit input. Turn rear panel key switch to RUN. Select TEST and check for a display of PASS. Turn rear panel key switch to CAL.

13. Select 10V range and apply 10V, 50kHz. Check display is 10.0000V ±1200 digits. Check that the display can be calibrated to 10.0000 ±20 digits by less than 5 presses of the AC HF key.

14. Select 100mV range and apply 100mV 50kHz. Check display is 100.000mV ±500 digits. Check that display can be calibrated to 100.000mV ±20 digits by less than 5 presses of the AC HF key.

15. Select 1000V range and apply 1000V, 500Hz. Select GAIN.

16. Apply 1000V, 25kHz and check display is 1000.00V ±1200 digits. Check that display can be calibrated to 1000.00V ±20 digits by less than 5 presses of the AC HF key. Remove 1000V and turn rear panel key switch to RUN.

The basic AC set-up procedure is complete.

APPENDIX 1

ANALOG DATA LINE 'F.E.T.' PATTERNS

DC Voltage

Range		DC Isolator							
		AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1	100mV	0	0	0	0	0	1	1	X
2	100mV	0	0	0	0	0	1	1	X
3	IV	0	0	0	0	1	1	1	X
4	10V	0	0	0	0	1	0	1	X
5	100V	0	0	0	0	1	1	0	X
6	1000V	0	0	0	0	1	0	0	X
7	1000V	0	0	0	0	1	0	0	X

AC Voltage

Range		AC assembly							
		AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1	100mV	0	0	1	0	0	0	1	X
2	100mV	0	0	1	0	0	0	1	X
3	1V	0	0	1	0	0	0	0	X
4	10V	0	0	0	1	0	0	0	X
5	100V	0	0	0	0	1	0	0	X
6	1000V	0	0	0	0	0	1	0	X
7	1000V	0	0	0	0	0	1	0	X

DC Coupled AC Voltage

Range		AC assembly							
		AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1	100mV	0	1	1	0	0	0	1	X
2	100mV	0	1	1	0	0	0	1	X
3	1V	0	1	1	0	0	0	0	X
4	10V	0	1	0	1	0	0	0	X
5	100V	0	1	0	0	1	0	0	X
6	1000V	0	1	0	0	0	1	0	X
7	1000V	0	1	0	0	0	1	0	X

Ohms

Range	DC Isolator								Ohms assembly							
	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1 10Ω	0	0	0	0	0	1	1	X	0	0	0	0	0	0	1	X
2 100Ω	0	0	0	0	1	1	1	X	0	0	0	0	0	0	1	X
3 1kΩ	0	0	0	0	1	1	1	X	0	0	0	0	0	1	0	X
4 10kΩ	0	0	0	0	1	1	1	X	1	0	0	0	0	0	0	X
5 100kΩ	0	0	0	0	1	1	1	X	0	0	0	0	1	0	0	X
6 1MΩ	0	0	0	0	1	1	1	X	0	0	1	1	0	0	0	X
7 10MΩ	0	0	0	0	1	1	1	X	0	1	0	1	0	0	0	X

DC Current

Range	DC Isolator								Current assembly							
	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1 100μA	0	0	0	0	0	1	1	X	0	1	0	0	0	0	1	X
2 100μA	0	0	0	0	0	1	1	X	0	1	0	0	0	0	1	X
3 1mA	0	0	0	0	0	1	1	X	1	0	0	0	0	0	1	X
4 10mA	0	0	0	0	0	1	1	X	1	1	1	0	0	0	1	X
5 100mA	0	0	0	0	0	1	1	X	1	1	0	1	0	0	1	X
6 1A	0	0	0	0	0	1	1	X	1	1	0	0	1	0	1	X
7 1A	0	0	0	0	0	1	1	X	1	1	0	0	1	0	1	X

AC Current

Range	AC assembly								Current assembly							
	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1 100μA	0	0	1	0	0	0	1	X	0	1	0	0	0	1	0	X
2 100μA	0	0	1	0	0	0	1	X	0	1	0	0	0	1	0	X
3 1mA	0	0	1	0	0	0	1	X	1	0	0	0	0	1	0	X
4 10mA	0	0	1	0	0	0	1	X	1	1	1	0	0	1	0	X
5 100mA	0	0	1	0	0	0	1	X	1	1	0	1	0	1	0	X
6 1A	0	0	1	0	0	0	1	X	1	1	0	0	1	1	0	X
7 1A	0	0	1	0	0	0	1	X	1	1	0	0	1	1	0	X

DC Coupled AC Current

Range	AC assembly								Current assembly							
	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
1 100μA	0	1	1	0	0	0	1	X	0	1	0	0	0	1	0	X
2 100μA	0	1	1	0	0	0	1	X	0	1	0	0	0	1	0	X
3 1mA	0	1	1	0	0	0	1	X	1	0	0	0	0	1	0	X
4 10mA	0	1	1	0	0	0	1	X	1	1	1	0	0	1	0	X
5 100mA	0	1	1	0	0	0	1	X	1	1	0	1	0	1	0	X
6 1A	0	1	1	0	0	0	1	X	1	1	0	0	1	1	0	X
7 1A	0	1	1	0	0	0	1	X	1	1	0	0	1	1	0	X

TEST

Function Tested	Range Checked	DC Isolator								Option assembly							
		AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7	AD0	AD1	AD2	AD3	AD4	AD5	AD6	AD7
DC	.1	0	0	0	0	0	1	0	1								
	1	0	0	0	0	1	1	0	1								
	10	0	0	0	0	1	0	0	1								
										Ohms assembly							
kΩ	10	0	0	0	0	1	1	1	1	0	1	0	1	0	0	0	1
										AC assembly							
AC	.1	Not used								0	0	1	0	0	0	1	1
	1									0	0	1	0	0	0	0	1
										I assembly							
I	.1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	1	1

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED
R1	090001	P.T.C. THERMISTOR	MULLARD	VA 8650	2
R2	090001	P.T.C. THERMISTOR	MULLARD	VA 8650	—
R3	000151	150 Ω 1/4 W CARBON	MULLARD	CR25	8
R4	000151	150Ω " " "	"	"	—
R5	000151	150Ω " " "	"	"	—
R6	000102	1K 1/4 W. CARBON	"	CR25	1
R7	000104	100K 1/4 W. CARBON	MULLARD	CR25	1
R8	000151	150 Ω 1/4 W. CARBON	MULLARD	CR25	—
R9	000151	150Ω " " "	"	"	—
R10	000151	150 Ω " " "	"	"	—
R11	000151	150Ω " " "	"	"	—
R12	000151	150Ω " " "	"	"	—
AN1	090032	150R×7 2% NETWORK	BECKMAN	764 - 1 - R150	2
AN2	090032	" " " "	"	"	—
C1	102101	100PF CER DISC	ERIE	801	1
C2	150002	10 μF 20% 16V DIP TANT	UNION CARBIDE	K10E16	2
C3	150016	1·0 μF 20% 35V "	UNION CARBIDE	K1R0E35	2
C4	101103	0·01μF 250V CER DISC	ERIE	801	3

CIRCUIT DIAG 430294
CHECK PROC. 460294
CHECK LIST 470294

C	D	1 C	2	3	4 C	5	6	7
		RELEASED	ECO 778	816/818	867.	988	1111	1213
	17-8-78	29-9-78	6-12-78	25-JAN 79	11 JUN 79	26 OCT 79	21.4.80	11-6-81
	MD				MD	MD	MD	MD

28-4-78
B.J.
datron
1061/1071
FRONT P.C.B. ASSY
400294
2 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED PER ASSY
C5	101103	0·01μF. 250V CER DISC	ERIE	801	—
C6	150016	1·0 μF 20% 35V DIP TANT	UNION CARBIDE	K1R0E35	—
C7	101103	0·01μF 250V CER DISC	ERIE	801	—
C8	150002	10μF 20% 16V. DIP. TANT	UNION CARBIDE	K10E16	—
C9	104023	2n2F 20% 1KV CER DISC	ITT	HD16K102N2MS-SS1K0DSC	1
Q1	240001	Si NPN	NATIONAL	BC184K	6
Q2	240001	Si NPN	NATIONAL	BC184K	—
Q3	240001	" "	"	"	—
Q4	240001	"	"	"	—
Q5	240001	" "	"	"	—
Q6	240001	" "	"	"	—
M1	290042	G.P. HIGH CURRENT. TRANS ARRAY	R.C.A.	CA3081P	3
M2	280011	DUAL D FLIP-FLOP	MOTOROLA	MC14013 BCP	1
M3	290042	G.P. HIGH CURRENT TRANS ARRAY	R.C.A	CA3081P	—
M4	280015	QUAD LATCH	MOTOROLA	MC14076	7

NOTES

SEE SHEET 2 FOR LATEST ISSUE

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DATE	
CHKD.	

DATE
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datron ELECTRONICS LTD
TITLE 1061/71
FRONT. P.C.B ASSY.
DRAWING NUMBER 400294
SHEET 3 OF 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
M5	280015	QUAD LATCH	MOTOROLA	MC14076	—
M6	280015	" "	"	"	—
M7	280067	16WAY. KEYBOARD ENCODER	NATIONAL	MM74C922	2
M8	280015	QUAD LATCH	MOTOROLA	MC14076	—
M9	280015	QUAD LATCH	"	"	—
M10	280067	16 WAY. KEYBOARD ENCODER.	NATIONAL	MM74C922	—
M11	280015	QUAD LATCH	MOTOROLA	MC14076	—
M12	280015	" "	"	"	—
M13	290042	G.P. HIGH CURRENT. TRANS ARRAY	RCA	CA3081P	—
S1	700019	SLIDE SWITCH	SIEMENS	C-42315-A60-A1	2
S2	700019	" "		"	—
S3	700061	KEYBOARD SWITCH. RED. LED.	SCHADOW	SRL-RED LED	24
S4	700061	" " " "		" " "	—
S5	700061	" " " "		" " "	—
S6	700061	" " " "		" " "	—
S7	700061	" " " "		" " "	—
S8	700061	" " " "		" " "	—
S9	700061	" " " "		" " "	—
S10	700062	KEYBOARD SWITCH. GREEN LED	S[illegible]	SRL - GREEN LED	2

NOTES

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TITLE 1061/71
FRONT. P.C.B ASSY

DRAWING NUMBER 400294

SHEET 4 OF 6

J.W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PR[illegible] M[illegible]	MANUFACTURER'S PART No	No USED Per Assy
S11	700061	KEYBOARD. SWITCH. RED. LED.	[illegible]	SRL - RED LED	—
S12	700061	" " " "		" " "	—
S13	700061	" " " "		" " "	—
S14	700061	" " " "		" " "	—
S15	700061	" " " "		" " "	—
S16	700061	" " " "		" " "	—
S17	700061	" " " "		" " "	—
S18	700061	" " " "		" " "	—
S19	700061	" " " "		" " "	—
S20	700061	" " " "		" " "	—
S21	700061	" " " "		" " "	—
S22	700061	" " " "		" " "	—
S23	700061	" " " "		" " "	—
S24	700061	" " " "		" " "	—
S25	700061	" " " "		" " "	—
S26	700061	" " " "		" " "	—
S27	700061	" " " "		" " "	—
S28	700062	KEYBOARD SWITCH. GREEN. LED.	S[illegible]	SRL-GREEN LED	-

NOTES.

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TITLE 1061/71
FRONT. P.C.B. ASSY

DRAWING NUMBER 400294

SHEET 5 OF 6

J.W. 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	410090-4~	PRINTED CIRCUIT BOARD			1
	450179-1	TERMINAL PLATE.			1
	605060	I.C. SOCKET 14 WAY	AUGAT	314-AG-39D	1
	605061	I.C. SOCKET 16 WAY	AUGAT	316-AG-39D	10
	605062	I.C. SOCKET 18 WAY	AUGAT	318-AG-39D	2
	540002	22 SWG TIN CU WIRE			A/R
	630024	INSULATING BEADS			8
	800017	8½ DIGIT DISPLAY	DALE		1
	920015	LOW. E.M.F. TERM. BLK/BLK	CLIFF	TP1 - SPECIAL	1
	920041	" " " BLK/RED	CLIFF	" "	1
	920042	NOT LOW E.M.F. TERM BLK/WH	"	TP1	1
	920043	" " " " BLK/BRN	"	"	1
	920044	" " " " BLK/BLUE	"	"	1
	920045	" " " " BLK/YELLOW	"	"	1
	630029	DOUBLE SIDED PRESSURE SENSITIVE TAPE.	3M	TYPE 4032	4 x 25 mm
	420080-1	WARNING LABEL			1
	590004	SLEEVE - PTFE	HELLERMANN	FE10	45 mm
	613009	SOLDER TAG 4BA TINNED BRASS	R.S.		2
	590032	HEATSHRINK ⌀4·8 YELLOW			A/R

NOTES

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TITLE 1061/71
FRONT. P.C.B. ASSY.

DRAWING NUMBER 400294

SHEET 6 OF 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No USED Per Assy
R1	000104	100K 5% 1/4W CARBON	MULLARD	CR25	1
R2	066200	20R POT 3/8 SQ VERT. CERMET	BECKMAN	72XW	1
R3	000221	220R 5% 1/4W CARBON	MULLARD	CR25	1
R4	014300	430R 1% M.F.	HOLCO	H.8	1
R5	000102	1K 5% 1/4W CARBON	MULLARD	CR25	2
R6	000184	180K 5% 1/4W CARBON	MULLARD	CR25	1
R7	066102	1K 3/8" RIGHT ANGLED CER. POT	BECKMAN	72XW	1
R8	014021	4K02 1% 1/8W M.F	HOLCO	H.8.	1
R9	019101	9K1 1% 1/8W M.F.	HOLCO	H.8	1
R10	012001	2K 1% 1/8W M.F	HOLCO	H.8.	1
R11	011302	13K 1% 1/8W M.F	HOLCO	H.8.	1
R12	066501	500R 3/8" RIGHT ANGLED CER. POT	BECKMAN	72xW	1
R13	000102	1K 5% 1/4W CARBON.	MULLARD	CR25	–
L1	370001	10μH 0.85Ω RF CHOKE	PLESSEY	58/10/0011/10	3
L2	370001	10μH "	"	"	–
L3	370001	10μH "	"	"	–
C1	110013	0·1μF 10% 250V POLYESTER	MULLARD	C280AE/P100K	1
C2	NOT USED				
C3	NOT USED				

NOTES CIRCUIT DIAG 430295
CHECK PROC. 460295
CHECK LIST. 470295

SEE SHEET 1 FOR LATEST ISSUE

ISS	C	D	1	2	3	4	5	6
ECO			RELEASED	ECO783	ECO 816	876 882 900	[illegible]	1085 1097
DATE		22-8-78	29-9-78	18-12-78	25 JAN 79	6. JUN 79	31-10-79	21.4.80
CHKD		ND		ND	[illegible]	ND	ND	ND

DATE 2-5-78
DRAWN B.J.
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TITLE 1061 / 1071
REAR P.C.B ASSY
DRAWING NUMBER 400295
SHEET 2 OF 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C4		NOT USED			
C5	101103	0·01μF 250V CER DISC	ERIE	801	4
C6	180026	10μF 350V ELECT	ITT	EN12/12 10/35C	1
C7	180004	4700μF 16V AL ELECT	WIMA	PRINTILYT	1
C8	101103	0·01μF 250V CER. DISC	ERIE	801	–
C9	150003	47μF 20% 6V3 DIP. TANT	UNION CARBIDE	K47E6V3	1
C10	150021	22μF 20% 25V DIP. TANT	UNION CARBIDE	K22E25	2
C11	150021	" " " "			–
C12	101103	0·01μF 250V. CER. DISC.	ERIE	801	–
C13	180025	1000μF 35V ELECT.	WIMA	PRINTILYT	2
C14	101103	0·01μF 250V. CER DISC	ERIE	801	–
C15	180025	1000μF 35V ELECT	WIMA	PRINTILYT	–
C16	102102	1nF 10% 500V CER DISC	ITT	CD10	1
D1	200010	Si RECTIFIER 3A 100V	INTERNATIONAL RECT	30S1	2
D2	200010				–
D3	210068	6V8 400mW ZENER	MULLARD	BZY88C6V8	1
D4	213004	180V 500mW ZENER	MOTOROLA	1N5279B	1

NOTES

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ISS								
ECO								
DATE								
CHKD								

2-5 78
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1061/71
REAR P.C.B ASSY
400295
3 OF 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURERS PART No	No USED Per Assy
Q1	240018	300V NPN TRANSISTOR	MOTOROLA	MJE 340	2
Q2	240018			"	—
M1	260005	5V 1A REGULATOR	MOTOROLA	MC7805CP	1
M2	260024	POSITIVE VOLTAGE REGULATOR	FAIRCHILD	μA 78 MGUIC	1
M3	260023	NEGATIVE VOLTAGE REGULATOR	FAIRCHILD	μA 79 MGUIC	1
W1	209014	1A5 400V BRIDGE RECT	MICRO ELECTRONICS	W004	1
W2	209004	100V 1A BRIDGE RECT	GENERAL INSTRUMENT	W01	1
J1					
J2	620003	SOLDER PCB TERMINAL LUG	HARWIN	H2105A	5
J3	604032	4 WAY FLAT TIN WAFER PIN	MOLEX	22-27-2041 / TIN	11
J4	604032	" " " "		"	—
J5	604033	" " GOLD		" /GOLD	6

NOTES

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datron ELECTRONICS LTD
TITLE 1061/71
REAR P.C.B. ASSY
DRAWING NUMBER 400295
SHEET 4 OF 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
J6	604032	4 WAY FLAT TIN WAFER PIN	MOLEX	22-27-2041 / TIN	—
J7	604032	" " " "	"	"	—
J8					
J9	604032	4 WAY FLAT TIN WAFER PIN	MOLEX	22-27-2041 / TIN	—
J10	604032	" " " "	"	"	—
J11	604033	4 WAY FLAT GOLD WAFER PIN	MOLEX	22-27-2041/GOLD	—
J12	604033	" " " "	"	"	—
J13	604033	" "		"	—
J14					
	410091-5	PRINTED CIRCUIT BOARD			1
	450180-1	HEATSINK 5V	ADVANCE		1
	450183-1	HEATSINK 15V	ADVANCE		3
	540002	22SWG TIN CU WIRE			A/R
					—
	611037	SCREW M3x8mm. NYLON HEX.HD	NYLON & ALLOYS		9
	613005	WASHER M3 INT/SHAKEPROOF.ST.	GKN DISTRIBUTORS		4
	613017	WASHER M3 FLAT NYLON	NYLON & ALLOYS		9
	615002	NUT. M3 FULL HEX STEEL	GKN	ZINC PLATED	2
	615008	NUT. M3 FULL HEX NYLON	GKN		3

NOTES

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E.C.O
DATE
CHKD

DATE 2-5-78
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DATE

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TITLE 1061/71
REAR P.C.B. ASSY
DRAWING NUMBER 400295
SHEET 5 OF 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
—	611016	SCREW M3 x 8mm STEEL POZI PAN ZINC PL	GKN		4
—	618007	MELINEX WASHERS 12·7 x 16·5 x 0·05mm	JERMYN	J26-5001	3
—	590004	SLEEVE - PTFE	HELLERMANN ELECTRIC.	FE 10	A/R.
—	900004	SILICONE RUBBER COMPOUND	RS.	554-119	A/R
—	420080-1	WARNING LABEL			2

2-5-78

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1061/71
REAR P.C.B ASSY

DRAWING NUMBER 400295

SHEET 6 OF 6

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
J2	572115 /C	16WAY RIBBON CABLE ASSY	DATRON.		1
J3	604035	4CCT. RIGHT ANGLED WAFER. GOLD.	MOLEX.	22-12-2041.	5
J4	604035.	" " " "		"	—
J6	604035.	" " " "	"	"	—
	410092-5A	P.C.B			1
	540002	22SWG TIN CU. WIRE			A/R
J1 & J5	604036	STRIP OF 10 AMP PINS	AMP	163740-8	4
	630023	SCOTCHFLEX ADHESIVE CLIP	3M	CLIP 706	1
	630099	25mm MASKING TAPE	3M	SCOTCH N.230	A/R.
R1	000473	47K 5% 1/4W CARBON	MULLARD	CR25	2
R2	000473	47K " " "	"	"	—
D1	200002	Si RECTIFIER 1A 50V	FAIRCHILD	IN4001	2
D2	200002	" " " "	"	"	—

NOTES. CIRCUIT DIAGRAM . 430296
CHECK PROC. . 460296
CHECK LIST. . 470296.

SEE SHEET 2 FOR LATEST ISSUE

ISS	C	D	1 C	2	3	4	5	6	7	8
E.C.O.	—	—	RELEASED	ECO 784	ECO 849	867/904	992	1000	1102	1217
DATE	—	25-8-78	29-9-78	6-12-78	4-5-79	11-6-79	25-10-79	18.1.80	14.4.80	18-8-81
CHKD	—	MD		MD	MD	MP	MD	MD	MD	MD

DATE 2-5-78

DRAWN B.J.

CHECKED

APPROVED

DATE

datron ELECTRONICS LTD

TITLE 1061/71
CENTRE P.C.B. ASSY

DRAWING NUMBER 400296

SHEET 2 OF 2

J.W 1164

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
J2	604035	RIGHT ANGLED WAFER PIN. GOLD	MOLEX	22-12-2041	12
J3	604035	" " " " "	"	"	—
J4	604035	" " " " "	"	"	—
J5	604035	" " " " "	"	"	—
J6	604035	" " " " "	"	"	—
	410093-4	PRINTED CIRCUIT BOARD			1
	510111	7/0·2 BROWN WIRE			120 mm
J1 & J7	604036	STRIP OF 10 AMP PINS	AMP	163740-8	2
	605053	12 WAY POLARISED SOCKET	MOLEX	22-01-2125	2
	605057	GOLD CRIMP PINS	MOLEX	4809-GL	7
	606004	PLASTIC POLARISING PEG	MOLEX	4161-1	4
	540002	22 S.W.G. TIN.CU. WIRE			A/R
	590001	SLEEVE MAX CABLE Ø3·0	HELLERMANN ELECTRIC	H15 x 20mm BLK HELSYN	1

NOTES. CIRCUIT DIAGRAM . 430297.
CHECK PROC. . 460297
CHECK LIST . 470297
SEE SHEET 2 FOR LATEST ISSUE

ISS	C	D	1	2
ECO	-	-	RELEASED	867
DATE	-	24-8-78	29-9-78	11-6-79
CHKD	-	MD		MD

DATE 28-4-78	datron ELECTRONICS LTD
DRAWN B.J.	TITLE 1061/71 L.H. PCB ASSEMBLY
CHECKED DG	
APPROVED	DRAWING NUMBER 400297
DATE	SHEET 2 OF 2

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1	000334	330K 5% 1/4W CARBON	MULLARD	CR25	2
R2	000334	" " "	"	"	–
	410094-4	P.C.B.			1
	540002	22S.W.G. TIN. CU. WIRE.			A/R
J2	574270/C	24WAY RIBBON CABLE ASSY	DATRON		1
J1 & J3	604036	STRIP OF 10AMP PINS	AMP	163740-8	4
	590001	SLEEVE MAX CABLE Ø 3.0	HELLERMANN ELECTRIC	H15x20mm BLK. HELSYN	2
	630099	25mm MASKING TAPE.	3M	SCOTCH N.230	A/R

NOTES. CIRCUIT DIAGRAM - 430298
CHECK PROC. - 460298
CHECK LIST - 470298

SEE SHEET 2 FOR LATEST ISSUE

No	C	D	1c	2	3	4	5
E.C.O.	–	–	RELEASED	ECO850	867/904	943	1217
DATE	–	24-8-78	29-9-78	4-5-79.	11-6-79.	10.9.79	18·8·81
CHKD	–	MD		MD	MD	MD	MD

DATE 28-4-78	datron ELECTRONICS LTD
DRAWN B.J.	TITLE 1061/71. R.H. P.C.B. ASSEMBLY
CHECKED	
APPROVED	
DATE	DRAWING NUMBER 400298 — SHEET 2 OF 2

J.W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED PER ASSY
R1	000333	33K 5% 1/4W CARBON	MULLARD	CR25	2
R2	000824	820K 5% 1/4W CARBON	MULLARD	CR25	1
R3	000223	22K 5% 1/4W CARBON	MULLARD	CR25	2
R4	000222	2K2 5% 1/4W CARBON	MULLARD	CR25	3
R5	000104	100K 5% 1/4W CARBON	MULLARD	CR25	3
R6	000104	100K 5% 1/4W CARBON	MULLARD	CR25	–
R7	000104	100K 5% 1/4W CARBON	MULLARD	CR25	–
R8	000102	1K 5% 1/4W CARBON	MULLARD	CR25	2
R9	000105	1M 5% 1/4W CARBON	MULLARD	CR25	3
R10	000105	1M 5% 1/4W CARBON	MULLARD	CR25	–
R11	000105	1M 5% 1/4W CARBON	MULLARD	CR25	–
R12	000103	10 K 5% 1/4W CARBON	MULLARD	CR25	5
R13	000103	10 K 5% 1/4W CARBON	MULLARD	CR25	–
R14	000103	10 K 5% 1/4W CARBON	MULLARD	CR25	–
R15	000222	2K2 5% 1/4W CARBON	MULLARD	CR25	–
R16	000223	22K 5% 1/4W CARBON	MULLARD	CR25	–
R17	000103	10K 5% 1/4W CARBON	MULLARD	CR25	–
R18	015112	51K1 1% 1/8W M.F	WELWYN	4033C	1
R19	070123	900R 0.1% 5 ppm/°C W.W.	MANN (KELVIN)	MX 125-B (EP-01)	1
R20	070124	90R 0.1% 5 ppm/°C W.W.	MANN	MX 125-B	1
R21	070125	9R 0.1% 5 ppm/°C W.W.	MANN	AX 175 BT	1
R22	070126	1R 0.1% 5 ppm/°C W.W.	MANN	LR 500 BU	1
R23	000222	2K2 5% 1/4W CARBON	MULLARD	CR25	–

A	B	C	1c	2	3	4	5	6	7	8	9
				972,987	1008 1012 1035 1039	1048	1087.1099. 1110	1116	1189	1080	1217
17 JULY 79	21 AUG 79	24.9.79	24.9.79	25-10-79	4-1-80	16.1.80	14.4.80	3.6.80	17.12.80	26.2.81	18.8.81
	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD

17 JULY 79
W.G. SMITH

datron ELECTRONICS

CURRENT P.C.B

DRAWING NUMBER 400304 2 7

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED PER ASSY
R24	000102	1K 5% 1/4W CARBON	MULLARD	CR25	–
R25	070127	0R1 0.1% 5ppm/°C W.W.	MANN	LR500BU	1
R26	000333	33K 5% 1/4W CARBON	MULLARD	CR25	–
R27	● 000331	330R 5% 1/4W CARBON	MULLARD	CR25	2
R28	● 000331	330R 5% 1/4W CARBON	MULLARD	CR25	–
R29	000103	10k 5% 1/4W CARBON	MULLARD	CR25	–
C1	150020	10uF 25V TANT	UNION CARBIDE	K10E25	2
C2	150020	10uF 25V TANT	UNION CARBIDE	K10E25	–
C3	101103	10nf 250V CER DISC	ERIE	801	1
C4	150014	680nf 35V 20% TANT	UNION CARBIDE	KR68E35	1
C5	150016	1uf 35V TANT	UNION CARBIDE	K1R0E35	2
C6	150016	1uf 35V TANT	UNION CARBIDE	K1R0E35	–
C7	* 102471	470pf 10% 500V CER DISC	ITT	CD10	1
	+ 102331	330pf 10% 500V CER DISC	ITT	CD10	
C8	102101	100pF 10% 500V CER DISC	ITT	CD10	1
C9	110013	100nF 20% POLYESTER	MULLARD	CZ80AEP100K	1

NOTES. * VALUE CORRECT IF R19 MANUFACTURED BY MANN - TYPE MX125-B
+ VALUE CORRECT IF R19 MANUFACTURED BY KELVIN - TYPE EP-01
● R27 + 28 NOT USED WITH RL1, RL2 ALTERNATIVE

FOR LATEST ISSUE

DATE 17 JULY 79
DRAWN W.G. SMITH
CHECKED
APPROVED
DATE

datron ELECTRONICS LTD

TITLE CURRENT PCB

DRAWING NUMBER 400304 SHEET 3 OF 7

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D1	200001	75mA. 75v. G.P. Si DIODE.	FAIRCHILD	IN4148.	5
D2	200008	200mA. 125v. L.L. Si DIODE.	FAIRCHILD.	IN458A.	3
D3	200008	200mA. 125V. L.L. Si DIODE	FAIRCHILD	IN458A.	–
D4	200008	200mA. 125v. L.L. Si DIODE.	FAIRCHILD	IN458A.	–
D5	200001	75mA. 75v. G.P. Si DIODE.	FAIRCHILD.	IN4148	–
D6	200001	75mA. 75v. G.P. Si DIODE.	FAIRCHILD.	IN4148	–
D7	200001	75mA. 75V. G.P. Si DIODE.	FAIRCHILD.	IN4148	–
D8	200001	75mA. 75V. G.P. Si DIODE.	FAIRCHILD	IN4148	–
D9		NOT USED			
D10		NOT USED			
D11	220020	FET DIODE 100pA I_R.	TELEDYNE.	PAD100	2
D12	220020	FET DIODE 100pA I_R.	TELEDYNE.	PAD100	–
D13	200010	3A. 100V. G.P. Si DIODE.	I.R.	3051	4
D14	200010	3A. 100V. G.P. Si DIODE.	I.R.	3051	–
D15	200010	3A. 100V. G.P. Si DIODE.	I.R.	3051	–
D16	200010	3A. 100V. G.P. Si DIODE.	I.R.	3051	–

NOTE

SEE SHEET 2 FOR LATEST ISSUE

DATE 17 JULY 79

datron ELECTRONICS LTD

DRAWN W.G. SMITH

TITLE CURRENT P.C.B

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DRAWING NUMBER 400304

SHEET 4 OF 7

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
Q1		NOT USED			
Q2	250001	Si P.N.P. TRANSISTOR.	NATIONAL.	BC214/ TO18	2
Q3		NOT USED			
Q4	250001	Si P.N.P. TRANSISTOR.	NATIONAL.	BC214/ TO18	-
Q5		NOT USED			
Q6		NOT USED			
Q7	230003	N - CHAN J FET.	TELEDYNE.	U1899 JF	1
Q8	230035	N - CHAN J FET.	TELEDYNE.	U1897 JF	2
Q9	230002	N - CHAN J FET.	TELEDYNE.	U1994 JF	1
Q10	230035	N - CHAN J FET.	TELEDYNE.	U1897 JF	–
M1	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	2
M2	280011	DUAL D FLIP FLOP	MOTOROLA	MC14013 BCP	1
M3	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	–
M4	270059	7× DARLINGTON DRIVER	SPRAGUE/ EXAR	ULN2004A / XR2204CP	1
M5	260027	714 OP AMP	FAIRCHILD	µA 714 HC	1

NOTES

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ISS												
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DATE												
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DRAWING NUMBER 400304

SHEET 5 OF 7

JW 1164

			DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
AN1			NOT USED			
RL1	*	330017	RELAY REED LOW THERMAL	OMRON	G2E 182PH	2
RL2	*	330017	RELAY REED LOW THERMAL	OMRON	G2E 182PH	-
RL3	(11)	330001	RELAY 4P2W CROSSBAR	P & B	R10-E1-L4-Q2-5K	1
RL4	(1)	330003	RELAY 2P2W CROSSBAR	P & B	R10-E1-L2-Q5-8K (25207)	1
		400379/1	MOLEX TERMINAL/WIRE ASSY	DATRON		1
		410104-5	PRINTED CIRCUIT BOARD			1
		459112	RELAY BRACKET			2
		540008	7/0.2 PTFE INSULATED WHITE WIRE		TYPEC	807mm TOTAL
		540002	22SWG TINNED COPPER WIRE			A/R
		590001	SLEEVE BLACK	HELLERMAN ELECTRIC	H16x20mm HELYSYN	16
		605056	CRIMP TERMINAL	MOLEX	4809-TL	3
J1		571095/C	16 WAY AP/3M RIBBON CABLE	DATRON		1
		605060	14 WAY D.I.L. SOCKET	ASTRALUX OR JERMYN	ICL-143-S3T	1
		605061	16 WAY D.I.L. SOCKET	ASTRALUX OR JERMYN	ICL-163-S6T	3
		605051	4 WAY POLARISED SOCKET	MOLEX	(22-01-2045) 6471-4-1	1
J3		605052	8 WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-8-1	1
J2		605053	12 WAY POLARISED SOCKET	MOLEX	(22-0-2125) 6471-12-1	1
		605057	CRIMP TERMINAL	MOLEX	4809-GL	8

* ALTERNATIVE 330014 OR 330013
(1) ALTERNATIVE 330015 } USE M2.3 FULL HEX. NUT – 615014 2 OFF
(11) ALTERNATIVE 330016 } (CHALLENGE IND. FASTENERS)

17 JULY 79
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datron ELECTRONICS LTD
TITLE CURRENT P.C.B
DRAWING NUMBER 400304
SHEET 6 OF 7

	PART No		PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
	611004	SCREW M3x6 POSI PAN			2
	613005	WASHER M3 INT/SHAKEPROOF			2
	615002	NUT M3 FULL HEX			2
	615005	NUT 3-48 UNC FULL HEX			2
	613014	WASHER M2.5 INT SHAKEPROOF			2
	617010	NYLATCH PLUNGER	C.J. FOX & SON	HN3P-32-4-1	4
	617011	NYLATCH GROMMET	C.J. FOX & SON	HN3G	4
	620003	SOLDER P.C.B TERMINAL LUG	HARWIN	H2105A	13
	630024	STANDARD STEATITE INSUL. BEAD	PARK ROYAL PORCELAIN CO.	TYPE No 2 (16SWG.)	24
	920082	FUSE HOLDER. 20mm P/MTG	BELLING & LEE	L2002	1
	920071	FUSE 1.6A QUICK ACTING 20mm	BESWICK	S501-1.6-F-250V	1
	590004	SLEEVE – PTFE	HELLERMANN ELECTRIC	FE10	A/R
	590055	SLEEVE ⌀1.0 SIL. RUBBER	" "	H15 CONT. BLACK	30mm

NOTES

DATE 17 JULY 79
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DATE
datron ELECTRONICS LTD
TITLE CURRENT PCB
DRAWING NUMBER 400304
SHEET 7 OF 7

DESIGNATOR	DATRON PART No	DESCRIPTION	[illegible]	MANUFACTURERS PART No	No USED PER ASSY
R1	000104	100K 5% ¼W CARBON	MULLARD	CR25	6
R2	000104	100K "			–
R3	000104	100K " " "	"	"	–
R4	000104	100K " " "	"	"	–
R5	000103	10K " " "	"	"	2
R6	000104	100K " " "	"	"	–
R7	000104	100K " " "	"	"	–
R8	000103	10K " " "	"	"	–
AN1	090017	100K ×7. 2% NETWORK	BECKMAN	764-1-R100K	3
AN2	090017	100K ×7. " "	"	"	–
AN3	090017	100K ×7. " "	"	"	–

ISSUE	A	1C	2	3	4	5	6
		–	1008	1000,1052	1178	1198	1217
DATE	25.4.79	18 MAY 79	26 OCT 79	18.1.80	14.10.80	24.2.81	18.8.81
CHKD			MD	MD	MD	MD	MD

25 APRIL 79
W.G.SMITH.
G.C.M
18 MAY 79

datron

I.EEE 488 OPTION

400306 2 5

DESIGNATOR	DATRON PART No	[illegible]	[illegible]	[illegible]	[illegible]
C1	150012	100nF 20% 35V DIP TANT	UNION CARBIDE	K1R0E35	1
C2	150016	1µF 20% 35V DIP TANT	" "	K1R0E16	1
C3	101103	10nF 25% 250V CER DISC	I.T.T	CD10	1
C4	150015	10µF 20% 35V DIP TANT	UNION CARBIDE	K10E35	4
C5	150015	10µF 20% 35V DIP TANT	" "	K10E35	–
C6	150015	10µF 20% 35V DIP TANT	" "	K10E35	–
C7	150015	10µF 20% 35V DIP TANT	" "	K10E35	–
M1	270049	QUAD BUS TRANSCEIVER	MOTOROLA	MC3446	4.
M2	280024	TRI-STATE HEX NON-INV BUFFER	"	MC14503 BCP	7
M3	280024	TRI-STATE HEX NON-INV BUFFER	"	MC14503 BCP	–
M4		TO BE FITTED AT FINAL ASSY STAGE			–
M5	270049	QUAD BUS TRANSCEIVER	MOTOROLA	MC3446	–
M6	280024	TRI-STATE HEX NON-INV BUFFER	"	MC 14503 BCP	–
M7	280024	TRI-STATE HEX NON-INV BUFFER	"	MC 14503 BCP	–
M8	270049	QUAD BUS TRANSCEIVER	"	MC3446	–
M9	280024	TRI-STATE HEX NON-INV BUFFER	"	MC 14503 BCP	–
M10	280064	I.E.E.E 488 INTERFACE CHIP	"	MC 68488P	1
M11	270049	QUAD BUS TRANSCEIVER	"	MC3446	–
M12	280024	TRI-STATE HEX NON-INV BUFFER	"	MC14503 BCP	–

NOTES

SEE SHEET 2 FOR LATEST ISSUE

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DATE 25 APRIL 79
DRAWN W.G.SMITH
CHECKED G.C.M
APPROVED
DATE 18 MAY 79

datron ELECTRONICS LTD

TITLE I.E.EE 488 OPTION

DRAWING NUMBER 400306

SHEET 3 OF 5

	ATRON AR N	[illegible]	[illegible]	PA	ASS.
M13	280024	TRI-STATE HEX NON-INV BUFFER	MOTOROLA	MC14503 BCP	—
M14	270050	HEX INVERTER	FAIRCHILD	F74LS04	1
M15	270055	DUAL 4 INPUT NAND	"	74LS20	2
M16	280066	256×4 BIT STATIC CMOS RAM	SEE DRAWING		2.
M17	280068	DUAL MONOSTABLE MULTIVIBRATOR	MOTOROLA	MC14538 BCP	1
M18	270055	DUAL 4 INPUT NAND	FAIRCHILD	74LS20	—
M19	27005'	DUAL 4 INPUT AND	"	74LS21	1
M20	280066	256×4 BIT STATIC CMOS RAM	SEE DRAWING		—

25 APRIL 79
datron
W.G.SMITH
G.C.M
I.E.E.E 488 OPTION
18 MAY 79
400306 4 5

DESIGNATOR	ATR N	[illegible]	VANGA	FAR N	ASS.
	400379/1	WIRE/TERMINAL ASSY			2
	410101-4	PRINTED CIRCUIT BOARD			1
	573120/C	24 WAY AP/3M RIBBON CABLE	DATRON		1
	540002	22 SWG TINNED COPPER WIRE			A/R
	590004	SLEEVE – PTFE	HELLERMANN ELECTRIC	FE10	A/R
J2	605002	16 WAY LOW PROFILE SOCKET	JERMYN/ANTIFERENCE	A23-2001/Y OR ICN 163-S3G	1
	605060	14 WAY D.I.L. SOCKET	ASTRALUX	I.C.L-143-S3T	4
	605061	16 WAY D.I.L SOCKET	"	I.C.L-163-S6T	12
	605050	40 WAY D.I.L. SOCKET. LOW PR'FLE	AUGAT	340-AG39D	1
J4	605051	4 WAY POLARISED SOCKET	MOLEX	(22-01-2045) 6471-4-1	1
	605063	22 WAY D.I.L. SOCKET	AUGAT	322-AG39D	2
J1	605064	24 WAY D.I.L SOCKET	"	324-AG39D	1
	605056	CRIMP TERMINAL	MOLEX	4809 TL	2
	606005	SOCKET CLIP	ANTIFERENCE	RC-74	1
	617010	NYLATCH PLUNGER HN3P	RICHO	HN3P-32-4-1	6
	617011	NYLATCH GROMMET HN3G	"	HN3G-32-1	6
	620003	SOLDER PCB TERMINAL LUG	HARWIN	H2105A	1

NOTES

UR LATEST ISSUE

S
ECO
DATE
CHKD

DATE 25 APRIL 79
datron ELECTRONICS LTD
DRAWN W.G.SMITH
CHECKED G.C.M
APPROVED
DATE 18 MAY 79.
TITLE I.E.E.E 488 OPTION
DRAWING NUMBER 400306
SHEET 5 OF 5

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION				PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1	000123	12K	5%	1/4W	CARBON	MULLARD	CR25	3
R2	000332	3K3	"	"	"	"	"	6
R3	000332	3K3	"	"	"	"	"	–
R4	000183	18K	"	"	"	"	"	2
R5	000123	12K	"	"	"	"	"	–
R6	000222	2K2	"	"	"	"	"	2
R7	000 222	2K2	"	"	"	"	"	–
R8	000123	12K	"	"	"	"	"	–
R9	000333	33K		"	"	"	"	1
R10	000562	5K6	"	"	"	"	"	1
R11	000183	18K	"	"	"	"	"	–
R12	000105	1 M	"	"	"	"	"	1
R13	000332	3k3	"	"	"	"	"	–
R14	000103	10k	"	"	"	"	"	2
R15	000332	3k3	"	"	"	"	"	–
R16	000332	3k3	"	"	"	"	"	–
R17	000681	680R	"	"	"	"	"	2
R18	000681	680R	"	"	"	"	"	–
R19	000332	3k3	"	"	"	"	"	–
R20	000103	10k	"	"	"	"	"	–

SEE SHEET 3 FOR LATEST ISSUE

ISS	1	2	3 c	4	5	6	7	8
ECO	RELEASED	902/887	972	981	1021 1034	1085	1166	1199
DATE	26-3-79	15-6-79	25-10-79	6-11-79	2-1-80	22.4.80	24.9.80	24.2.81
CHKD	MD	MD	MD	MD	MD	MD	MD	MD

DATE 5-3-79
DRAWN B.J.
CHECKED MD
APPROVED
DATE

datron ELECTRONICS LTD
TITLE REAR INPUT / RATIO ASSY.
DRAWING NUMBER 400307.
SHEET 3 OF 8

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C1	150022	2μ2F 20% 35V DIP. TANT	UNION CARBIDE	K2R2E35	2
C2	150022	2μ2F 20% 35v DIP. TANT	UNION CARBIDE	K2R2E35	–
C3	150007	6μ8F 20% 16v DIP. TANT	UNION CARBIDE	K6R8E16	2
C4	150007	6μ8F 20% 16V DIP. TANT	UNION CARBIDE	K6R8E16	–
C5	102101	100pF 10% 500V CER DISC	ITT	CD10	1
C6	110013	100nF 20% 250v POLYESTER	MULLARD	C280AEP100K	1

NOTES

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ISS												
ECO												
DATE												
CHKD												

DATE 23.9.80
DRAWN IL
CHECKED
APPROVED
DATE

datron ELECTRONICS LTD
TITLE REAR INPUT/ RATIO 1061/1071
DRAWING NUMBER 400307
SHEET 4 OF 8

J.W 1164

DES. No.	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy.
D1	200001	75mA 75V GP. Si DIODE	FAIRCHILD	IN4148.	8
D2	200001	" " " " "	"	"	–
D3	200001	" " " " "	"	"	–
D4	200001	" " " " "	"	"	–
D5	200001	" " " " "	"	"	–
D6	200001	" " " " "	"	"	–
D7	200001	" " " " "	"	"	–
D8	200001	" " " " "	"	"	–
Q1	240001	Si NPN TRANSISTOR	NATIONAL	BC184 /TO18	4
Q2	240001	" " "	"		–
Q3	250001	Si PNP TRANSISTOR	NATIONAL	BC 214 /TO18	2
Q4	250001	" " "	"	"	–
Q5	240001	Si NPN TRANSISTOR	NATIONAL	BC184/ TO18	–
Q6	240001	" " "	"	"	–
M1	280011	DUAL D FLIP-FLOP	MOTOROLA	MC 14013 BCP	1
J1	604036	CON. PIN. STRIP OF 10. HORIZ. TYPE	AMP	163740-8	2
J2, J3	605052	8 WAY POLARISED SOCKET.	MOLEX	(22-01-2085) 6471-8-1	2

5-3-79

B.J

MD

datron ELECTRONICS LTD

REAR INPUT / RATIO ASSY

DRAWING NUMBER 400307 SHEET 5 8

DES. No.	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
J4 & J6	604033	FLAT WAFER PIN (4WAY GOLD)	MOLEX	22-27-2041 / GOLD	3
J5	605051	4 WAY POLARISED SOCKET	MOLEX	22-01-2045	1
	400379/4	WIRE/TERMINAL ASSY	HOLDEN CORDS		6
	400379/5	" " "	" "		4
RL1 & RL4.	(1) 330003	RELAY 2P2W CROSSBAR	P&B	R10-E1-L2-Q5-8K (25207).	2
RL2 & RL3.	(11) 330001	RELAY 4P2W CROSSBAR	P&B	R10-E1-L4-Q2.5K	2
	410106-5	COMPONENT PCB			1
	410132-4	RELAY PCB			1
	450185-	SOCKET PLATE			1
	450241-	RELAY BRACKET			1
	540002	22SWG TINNED COPPER WIRE			A/R
	540008	7/.2 PTFE INS WHITE WIRE			140mm

NOTES (1) ALTERNATIVE RELAY 330015 (OMRON.) USE M2.3 FULL HEX. NUT-615014 (CHALLENGE IND. FASTENERS) 4 OFF

(11) ALTERNATIVE RELAY 330016 (OMRON)

SEE SHEET 3 FOR LATEST ISSUE

ISS											
ECO											
DATE											
CHKD											

DATE 5-3-79

DRAWN B.J

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APPROVED

DATE

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TITLE REAR INPUT / RATIO ASSY

DRAWING NUMBER 400307 SHT 6 8

J.W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURERS PART No	No. USED Per Assy
	590001	SLEEVE MAX CABLE ϕ 3·0mm	HELLERMANN ELECTRIC	H15 x 20mm BLK HELSYN	23
	590004	SLEEVE - PTFE	" "	FE 10	A/R
	602007	RELAY SOCKET 2 POLE PCB MOUNT	POTTER & BRUMFIELD	27E 212	1
	602009	RELAY SOCKET 4 POLE PCB MOUNT	" "	27E 213	1
J10, J11	604008	7 WAY PLUG PANEL MOUNT	PYE CONNECTORS	M7P	2
	605009	7 WAY SOCKET	PYE CONNECTOR	M7S	2
	605060	14 WAY DIL SOCKET	ASTRALUX OR JERMYN	ICN-246-S4T OR A23-2023Y	1
	605057	CRIMP TERMINAL	MOLEX	4809-GL	2
	606001	LOCKING HOOD	PYE CONNECTORS	MHN	2
	606002	NUT	PYE CONNECTORS	MN	2
	606003	WASHER	" "	MLW	2
	611004	SCREW M3 X 6mm STEEL POZI-PAN. ZINC PLATED	GKN		7
	611007	SCREW M3 X 6mm STEEL POZI-CSK. ZINC PLATED	GKN		7
	611016	" M3 X 8mm " " PAN " "	"		4
	612020	STANDOFF NYLON M3 X 19 TRANSIPILLAR.	W.K. ELECTRONICS	TP1/6·5/19/M3/I/I	5

NOTES

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ISS			
ECO			
DATE			
CHKD			

DATE 5-3-79

DRAWN B.J.

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datron ELECTRONICS LTD

TITLE REAR INPUT / RATIO ASSY

DRAWING NUMBER 400307

SHEET 7 OF 8

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURERS PART No	No. USED Per Assy
	613005	WASHER M3 INT/SHAKEPROOF ST.	GKN DISTRIBUTORS	ZINC PLATED	13
	615001	NUT 8BA FULL HEX STEEL		ZINC PLATED	2
	615002	" M3 " "		" "	2
	630005	CLIP FOR P&B R10 2 POLE RELAY	POTTER & BRUMFIELD	20C249	1
	630028	CLIP FOR P&B R10 4 POLE RELAY	" "	20C250	1
	700069	DPDT SLIDE SWITCH	WAVCOM	S-5022CD03-0 + 3/4" TRIGGER & STYLE 2/C PCB MOUNT, CONTACTS.	1

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS			
ECO			
DATE			
CHKD			

DATE 5-3-79

DRAWN B.J.

CHECKED MD

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DATE

datron ELECTRONICS LTD

TITLE REAR INPUT / RATIO ASSY

DRAWING NUMBER 400307

SHEET 8 OF 8

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy	
R1	000102	1K0 5% ¼W CARBON	MULLARD	CR25	1	
R2	000682	6K8 " " "	"	"	1	
R3	090001	PTC THERMISTOR	MULLARD	VA8650	2	
R4	090001	" "	"	"	–	
R5	066102	1K0 3/8" SQ VERTICAL POT	BECKMAN	72XW	1	
R6	000104	100K 5% ¼W CARBON	MULLARD	CR25	1	
R7	070128	21K51 0·1% WIRE WOUND	MANN	MX 125	1	
R8	070066	10K 0·1% WIRE WOUND	MANN	MX 125	1	
C1	101103	0·01μF 250V CER DISC	ITT	CD10K31N00JS 555003C	2	
C2	101103	0·01μF " " "	"	"	–	
C3 *	102330	33pF 500V CER DISC	ITT	CD10PG33P0JS 555003C	1	*
C4	102330	33pF " " "	"	"	1	
C5	110013	0·1μF 20% 250V POLYESTER	MULLARD	C280AE/P100K	1	

NOTES * ONLY REQUIRED WHEN M1 ALTERNATIVE (TYPE 101) IS USED
CCT DIAG 430308
CHECK PROC 480308. CHECK LIST 470308
SEE SHEET 2 FOR LATEST ISSUE

ISS	1	2	3
ECO	[illegible]	907	945
DATE	27·12·78	20.6.79	10.9.79
CHKD	MD		BJ

DATE 22-11-78
DRAWN B.J
CHECKED MD
APPROVED
DATE

datron ELECTRONICS LTD
TITLE ANALOGUE OUTPUT PCB ASSY.
DRAWING NUMBER 400308
SHEET 2 OF 4

W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy	
D1	213001	10V 5W ZENER	MOTOROLA	1N5347	2	
D2	213001	10V " "	"	"	–	
M1 *	260002	OP AMP	FAIRCHILD	μA741C	1	*
M2	260026	OP AMP	NATIONAL	LM212H	1	
	400379/4	WIRE / TERMINAL ASSY	HOLDEN CORDS		5	
	410107-3	P.C.B.			1	
	450186 -1	SOCKET PLATE.			1	
	510000	7/·2 PVC INSUL (BLACK) WIRE			50mm	
	510222	7/·2 PVC INSUL (RED) WIRE			50mm	
	540002	22 SWG TINNED CU WIRE			A/R	
	590001	SLEEVE MAX CABLE ϕ 3·0	HELLERMANN ELECTRIC	H15 x 20mm BLACK HELSYN	2.	
	605007	5 WAY SOCKET	PYE CONNECTORS	M55	1	
V1	605052	8 WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-8-	1	

NOTES * M1 ALTERNATIVE 260025 (LM101).

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ANALOGUE OUTPUT PCB ASSY
DRAWING NUMBER 400308
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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
	606001	LOCKING HOOD	PYE CONNECTORS	MHN	1
	606002	NUT	" "	MN	1
	606003	WASHER	" "	MLW	1
	612019	STANDOFF LOCKING TYPE 7/8" NYLON:	RICHCO	LCBS-14R	4
	620003	SOLDER PCB TERMINAL LUG	HARWIN	H2105A	2
	630024	INSULATING BEADS, STEATITE.		(TYPE N°2)	8.
*	604006	5 WAY PLUG	PYE CONNECTORS.	MSP.	1.
*	611016	SCREW POSI-PAN M3×8			4
*	613005	SHAKEPROOF WASHER M3			4

NOTES. * FITTED AT FINAL ASSEMBLY.

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J.W. 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1	000104	100K 5% 1/4W CARBON	MULLARD	CR25	13
R2	000101	100R " " "	"	"	4
R3	000101	100R " " "	"	"	–
R4	000105	1M 10% " "	"	"	11
R5	000822	8K2 " " "	MULLARD	CR25	3
R6	011302	13K0 1% 50ppm MF	HOLCO	HBC	2
R7	011302	13K0 " " "	"	"	–
R8	000101	100R 5% 1/4W CARBON	MULLARD	CR25	–
R9		NOT USED			
R10	000101	100R 5% 1/4W CARBON	"	"	–
R11		FSV		CR25	
R12	000472	4k7 " " "	"	"	11
R13	000104	100k " " "	"	"	–
R14	000472	4k7 " " "	"	"	–
R15		FSV		CR25	
R16	050038	6K34 1% 15ppm MF	ACI	EE-0-100-C4	2
R17	050037	4K75 1% 15ppm MF	ACI	EE-0-100-C4	2
R18		PART OF KIT WITH D59			
R19		PART OF KIT WITH D60			
R20	063203	20K POT CERMET	BECKMAN	72P	1
R21	000104	100K 5% 1/4W CARBON	MULLARD	CR25	–
R22	000102	1K " " "		"	4
R23	063205	2M POT CERMET	BECKMAN	72P	2

NOTES CIRCUIT DIAGRAM = 450328
CHECK PROCEDURE = 460328
CHECK LIST = 470328
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ISS	10	11	12	13	14	15	16
E.C.O	[illegible]	1000	[illegible]	1098. 1107	1128. 1050. 1117	1144. 1168	1114. 1182. 1184. 1188. 1191. 1190. 1193 1192
DATE	29-10-79	18.1.80	27.2.80	15.4.80	2.6.80	23.9.80	5.1.81.
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TITLE 1061 ANALOGUE PCB ASSEMBLY.
DRAWING NUMBER 400328
SHEET 2 OF 24

AW. 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R24	000820	820K 5% 1/4W CARBON	MULLARD	CR25	3
R25	000122	1K2 5% 1/4W CARBON	MULLARD	CR25	1
R26	000225	2M2 10% 1/4W CARBON	"	"	3
R27	000824	820K 5% 1/4W CARBON	"	"	–
R28	000222	2K2 5% 1/4W CARBON	"	"	7
R29	000100	10R " "	"		8
R30	000100	10R "	"	"	–
R31	000473	47K " "	"	"	3
R32	000393	39K " "	"	"	1
R33	000473	47K "	"	"	–
R34	000102	1K " "	"	"	–
R35	000104	100k " " "	"	"	–
R36	000104	100k " " "	"	"	–
R37	000562	5K6 " "	"	"	3
R38	050034	825R 1% 15ppm MF	ACI	EE0·100 C4	2
R39	050035	40R2 1% 15ppm MF	"	EE0·100 C4	2
R40	050035	40R2 1% 5ppm	"	"	–
R41		NOT USED			–
R42	050031	196R 1% 15ppm MF	ACI	EE 0·100 C4	2
R43	019768	97R6 1% 50ppm MF	HOLCO	H8C	2
R44		NOT USED			
R45		NOT USED			
R46	000182	1K8 5% 1/4W CARBON	MULLARD	CR25	1

NOTES

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SHEET 3 OF 24

W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R47	000100	10R 5% 1/4W CARBON	MULLARD	CR25	–
R48	000103	10K		"	11
R49	000103	10K "		"	–
R50	000103	10K			–
R51	000100	10R "			–
R52	000334	330K			4
R53	000334	330K			–
R54	000334	330K			
R55	000334	330K			–
R56	000104	100K			–
R57	000221	220R			3
R58	000821	820R			1
R59	000563	56K			6
R60	000222	2K2			–
R61	000105	1M0 10% 1/4W CARBON			–
R62	000105	1M0			–
R63	000221	220R5% 1/4W CARBON			–
R64		NOT USED			
R65	000102	1K 5% 1/4W CARBON			–
R66	000183	18K			1
R67	000562	5K6			–
R68	018060	806R 1% 50ppm MF	HOLCO	H8	2
R69	000114	110K 5% 1/4W CARBON	MULLARD	CR25	2

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J.W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R70	018060	806R 1% 50ppm MF	HOLCO	H8	–
R71	070115	12K0 1% 10ppm WW	MANN	MX125	2
R72	000472	4K7 5% 1/4W CARBON	MULLARD	CR25	–
R73	000103	10K "		"	–
R74	000275	2M7 "		"	2
R75	000565	5M6 " "		"	1
R76	000106	10M 10% 1/4W CARBON			3
R77	000226	22M " " "	ALLEN BRADLEY	CB2261	1
R78	000473	47K 5% 1/4W CARBON	MULLARD	CR25	–
R79	000392	3K9 " "		"	2
R80	000104	100K " "		"	–
R81	000472	4K7 " "		"	–
R82	000472	4K7 " "		"	–
R83	000472	4K7		"	–
R84	011378	13R7 1% 1/8W MF	HOLCO	H8	1
R85		NOT USED			
R86	000472	4K7 5% 1/4W CARBON	MULLARD	CR25	–
R87	000114	110K " " "		"	–
R88		NOT USED			–
R89	050031	196R 1% ppm MF	ACI	EE 0·100·C4	–
R90	019768	97R6 1% 50ppm MF	HOLCO	H8C	–
R91		NOT USED			
R92		NOT USED			

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R93	000124	120K 5% 1/4W CARBON	MULLARD	CR25	2
R94	000102	1K			-
R95	000106	10M 10%			-
R96	011473	147K 1% 50ppm MF	HOLCO	H8	1
R97		NOT USED			-
R98		NOT USED			-
R99	000472	4K7 5% 1/4W CARBON	MULLARD	CR25	-
R100	000472	4K7		"	-
R101	000100	10R 5% 1/4W CARBON	MULLARD	CR25	-
R102	000100	10R	"		-
R103	000271	270R		"	4
R104	000151	150R			1
R105	000271	270R "	"	"	-
R106	000222	2K2 "		"	-
R107	000222	2K2 "		"	-
R108	090038	10K811 ATTEN SET	MANN		1 SET
R109	090038	10K811	"		-
R110	090038	9K			-
R111	090038	1K			
R112	000682	6K8 5% 1/4W CARBON	MULLARD	CR25	1
R113	000105	1M0 10% 1/4W CARBON		"	-
R114	042214	2M21 1% 100ppm CERMET FILM	ALLEN BRADLEY	TYPE CC	1
R115	041004	1M 1% 100ppm CERMET FILM		"	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R116	000105	1M 5% 1/4W CARBON	MULLARD	CR25	-
R117	000105	1M			-
R118	000105	1M		"	-
R119	008012	27K 2W CARBON FILM	PIHER	"	2
R120	008012	27K	"	"	-
R121	008011	22K		"	2
R122	008011	22K	"	"	-
R123	000225	2M2 5% 1/4W CARBON	MULLARD	CR25	-
R124	011213	121K 1% 50ppm MF	HOLCO	H8	2
R125	000225	2M2 5% 1/4W CARBON	MULLARD	CR25	-
R126	013651	3K65 1% 50 ppm MF	HOLCO	H8	1
R127	000106	10M 10% 1/4W CARBON	MULLARD	CR25	-
R128	042215	22M1 1% 100 ppm CF	ALLEN-BRADLEY	CC	2
R129	042215	22M1 " 100ppm		"	-
R130	000362	3K6 5% 1/4W CARBON	MULLARD	CR25	2
R131	000362	3K6 "		"	-
R132	000105	1M " " "	"	"	-
R133	000105	1M " "	"	"	-
R134	000394	390K " "	"		1
R135	000275	2M7 " " "	"	"	-
R136	000395	3M9 " " "			1
R137	000223	22K " " "	"	"	2
R138	000125	1M2 " " "	"	"	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R139	000336	33M 10% ¼W CARBON	ALLEN-BRADLEY	CB3361	1
R140	090049	18M MATCHED PAIR	HOLCO		1 PAIR
R141	090049	18M " "			
R142	000272	2K7 5% ¼W CARBON	MULLARD	CR25	1
R143	090039	3M3, 10MΩ INPUT ATTEN. SET	MANN		1 SET
R144	000100	10R 5% ¼W CARBON	MULLARD	CR25	
R145	000100	10R			-
R146	000222	2K2			-
R147	000752	7K5			1
R148	090039	100K, 10MΩ INPUT ATTEN. SET	MANN		-
R149	090039	3M3, " " " "	"		-
R150	063204	200K POT CERMET	BECKMAN	72P	1
R151	063205	2M POT CERMET	"	"	1
R152		FSV	HOLCO	H8C	-
R153	011822	18K2 1% ⅛W MF	HOLCO	H8	1
R154	000103	10K 5% ¼W CARBON	MULLARD	CR25	-
R155	000221	220R " " "		"	-
R156	090039	3M3, 10MΩ INPUT ATTEN SET	MANN		-
R157	000103	10K 5% ¼W CARBON	MULLARD	CR25	-
R158	000332	3K3 " " "	"	"	1
R159	063103	10K POT CERMET	BECKMAN	72P	1
R160	063504	500K " "	"	"	1
R161	000104	100K 5% ¼W CARBON	MULLARD	CR25	-

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J.W. 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R162	000392	3K9 5% ¼W CARBON	MULLARD	CR25	-
R163	000107	100M 10% ¼W CARBON	ALLEN BRADLEY	CB1071	1
R164	000104	100K 5% ¼W CARBON	MULLARD	CR25	-
R165	000104	100k			-
R166	000563	56K 5%			-
R167	000562	5K6			-
R168	000563	56K			-
R169	000563	56K			-
R170	000564	560K			2
R171	000564	560K			-
R172	000335	3M3 10% ¼W CARBON	MULLARD	CR25	1
R173	000680	68R 5%			2
R174	000152	1K5			2
R175	000822	8K2			-
R176	000680	68R			-
R177	000152	1K5			-
R178	000822	8K2			-
R179	440067	PART OF KIT	DATRON.		1
R180	440067	" " "	"		-
R181	440067	" " "	"		-
R182	000472	4K7 5% ¼W CARBON	MULLARD	CR25	-
R183	000472	4K7 5% " "	"	"	-
R184	000270	27R " " "			2

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy.
R185	000270	27R 5% 1/4W CARBON	MULLARD	CR25	–
R186	000104	100K			–
R187	000222	2K2		"	–
R188	000103	10K			–
R189	000103	10K			–
R190	000561	560R			2
R191	000561	560R			–
R192	000155	1M5			1
R193	000104	100K			–
R194	011213	121K 1% 1/8W MF	HOLCO	H8	–
R195	015112	51K1		"	1
R196	000223	22K 5% 1/4W CARBON	MULLARD	CR25	–
R197	000222	2K2			–
R198	011002	10K 1% 1/8W MF	HOLCO	H8	1
R199	008007	10R 5% 0·2W CARBON	MULLARD	CR16	2
R200	008007	10R			–
R201	000824	820K 5% 1/4W CARBON	MULLARD	CR25	–
R202	000103	10K			–
R203	000104	100K			–
R204	000105	1M			–
R205	000105	1M			–
R206	000563	56K			–
R207	000103	10K			–

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R208	000333	33K 5% 1/4W CARBON	MULLARD	CR25	1
R209	000563	56K			–
R210	000103	10K "			–
R211	050038	6K34 1% 15 ppm MF	ACI	EE-0·100 C4	–
R212	050034	825R 1% 15ppm MF	ACI	EE-0·100 C4	–
R213	050037	4K75 1% 15ppm MF	ACI	EE-0·100 C4	–
R214	070115	12K0 1% 10ppm WW	MANN	MX125	–
R215	000271	270R 5% 1/4W CARBON	MULLARD	CR25	–
R216	000271	270R 5% 1/4W CARBON	MULLARD	CR25	–
R217		NOT USED			–
R218	030063	P.T.C THERMISTOR	TEXAS	TSP102K	1
R219	000224	220K 5% 1/4W CARBON	MULLARD	CR25	3
R220	000124	120k " " "	"	"	–
R221	000224	220K " " "	"		–
R222	000224	220K " " "	"		–
R223					
R224					2
R225					–
R226					
R227	000471	470R 5% 1/4W CARBON	MULLARD	CR25	1
R228		NOT USED			–
R229		NOT USED			–
R230		NOT USED			–

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R231		NOT USED			—
R232		NOT USED			—
R233		NOT USED			—
R234		NOT USED			—
R235		NOT USED			—
R236	016192	61k9 1% ⅛W 50ppm MF	HOLCO	H8C	2
R237	016192	61k9 1% ⅛W 50ppm MF	HOLCO	H8C	—
AN1	090050	3K3 SIP NETWORK	BECKMAN	764-1-R3·3K	1
AN2	090042	R-2R LADDER NETWORK	ERIE		1
C1	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	12
C2	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C3	104017	0·5pF 500V CER DISC	ERIE	831	1

NOTES

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No USED Per Assy
C4	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C5	102471	470pF 500V CER DISC	ERIE	801	3
C6	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C7	150020	10µF			—
C8	102150	15pF 500V CER DISC	ERIE	801	1
C9	140016	0·47µF 400V POLYPROP	RIFA	PHE 412 HFK	1
C10	110015	0·015µF 63V POLYESTER	WIMA	FKS2	1
C11	120026	680pF 20% 100V POLYCARB	WIMA	FKC2 MIN	1
C12	120004	680nF 10% 63V POLYCARB	ASHCROFT	A2B6811B	1
C13	102101	100pF 500V CER DISC	ERIE	801	3
C14	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C15	150020	10µF " " "			—
C16	102101	100pF 500V CER DISC	ERIE	801	—
C17	102100	10pF 500V CER DISC	ERIE	801	1
C18	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C19	150020	10µF " " "			—
C20	102470	47pF 500V CER DISC	ERIE	801	6
C21	102470	47pF 500V CER DISC	ERIE	801	—
C22	102101	100pF 500V CER DISC			—
C23	101103	0·01µF 250V CER DISC			6
C24	101103	0·0µF 250V CER DISC			—
C25	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C26	102471	470pF 500V CER DISC	ERIE	801	—

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C27	101103	0·01µF 250V CER DISC	ERIE	80	-
C28	102470	47pF 500V			-
C29	102470	47pF 500V			
C30		NOT USED			-
C31	130073	1nF 5% 160V POLYSTYRENE	SUFLEX	HSC1000/5-10/160	1
C32	101103	0·01µF 250V CER DISC	ERIE	80	-
C33	110013	0·1µF 10% 250V POLYESTER	MULLARD	C280AE/P100K	3
C34	101103	0·01µF 250V CER DISC	ERIE	801	-
C35	120016	2n2F 20% 100V POLYCARB	WIMA	FKC 2MIN.	1
C36	102471	470pF 500V CER DISC			-
C37	110013	0·1µF 10% 250V POLYESTER	MULLARD	C280 AE/P100K	-
C38	102470	47pF 500V CER DISC	ERIE	801	
C39	440067	PART OF KIT	DATRON		-
C40	440067	"	"		-
C41	440067	" "	"		-
C42	110013	0·1µF 10% 250V POLYESTER	MULLARD	C280AE/P100K	-
C43	150020	10µF 20% 25V DIP TANT	UNION CARBIDE	K10E25	-
C44	150020	10µF			-
C45	180006	47µF 25V AL.ELECT	MULLARD	016-16479	2
C46	180006	47µF 25V			-
C47	180022	33µF 40V		016-17339	2
C48	180022	33µF 40V			
C49	180024	10µF 63V AL ELECT	MULLARD	016-18109	2

NOTES

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C50	180024	10µF 63V AL.ELECT	MULLARD	016-18109	-
C51	101103	0·01µF 250V CER DISC	ERIE	801	-
C52	110017	0·022µF 10% 250V POLYESTER	MULLARD	C280AE/P22K	1
C53	102332	3n3F 500V CER DISC	ERIE	801	2
C54	102332	3n3F			-
C55	440067	PART OF KIT	DATRON		-
C56	150016	1µF 20% 35V DIP TANT	UNION CARBIDE	K1R0E35	1
C57	130013	18pF ±1pF 160V POLYSTYRENE	SUFLEX	HS	1
C58	110027	3300pF 20% 100V POLYESTER	WIMA	FKS2-MIN	1
C59		NOT USED			-
C60	102222	2n2F 500V CER DISC	ERIE	801	1
D1	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	25
D2	210056	C5V6 400mW ZENER	MULLARD	BZY 88C	2
D3	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	-
D4	210056	C5V6 400mW ZENER	MULLARD	BZY 88C	-
D5	200001	SI GEN. PURPOSE	FAIRCHILD	1N4148	18
D6	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	-

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy.
D7	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	–
D8	210082	C8V2 400mW ZENER	MULLARD	BZY88C	1
D9	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	–
D10	200008	" " "			–
D11	200008	" "			–
D12	200001	SI GEN PURPOSE	FAIRCHILD	1N4148	–
D13	200001	" "			–
D14	200001	" "			–
D15	200001	" "			–
D16	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	–
D17	200008	" " "			–
D18	210068	C6V8 400mW ZENER	MULLARD	BZY88C	2
D19	210068				–
D20	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	–
D21	200001	SI GEN PURPOSE	FAIRCHILD	1N4148	–
D22	210220	C22V 400mW ZENER	MULLARD	BZY88C	2
D23	210220	" "			–
D24	200001	SI GEN PURPOSE	FAIRCHILD	1N4148	–
D25	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	–
D26	200008	" "			–
D27	200008	"			–
D28	200008	" "			–
D29	200008				–

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
D30	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	–
D31	200001	SI GEN PURPOSE	FAIRCHILD	1N4148	–
D32	200001	" " "		"	–
D33	200001	" " "		"	–
D34	200001	" "			–
D35	210047	C4V7 400mW ZENER	MULLARD	BZY88C	1
D36	200008	SI LOW LEAKAGE	FAIRCHILD	1N458A	–
D37	200008	"			–
D38	200008			"	–
D39	200008	" "			–
D40	200001	Si GEN PURPOSE	FAIRCHILD	1N4148	–
D41	200001	Si GEN PURPOSE	FAIRCHILD	1N4148	–
D42	200001			"	–
D43	200002	SI RECTIFIER 1A 50V	MOTOROLA	1N4001	4
D44	200002	"		"	–
D45	200002	"		"	–
D46	200002			"	–
D47	210150	C15V 400mW ZENER	MULLARD	BZY88C	1
D48	200001	Si GEN PURPOSE	FAIRCHILD	1N4148	–
D49	210200	C20V 400mW ZENER	MULLARD	BZY88C	2
D50	210100	C10V 400mW ZENER	MULLARD	BZY88C	2
D51	210100	" " "	"	"	
D52	210200	C20V 400mW ZENER	MULLARD	BZY88C	–

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
D53	200008	SI LOW LEAKAGE	FAIRCHILD	IN458A	-
D54	200008				-
D55	200001	SI GEN PURPOSE		IN4148	-
D56	200001				-
D57		NOT USED			-
D58		NOT USED			-
D59	219007	214009 SELECTED WITH R18			2
D60	219007	214009 SELECTED WITH R19			-
D61	210033	C3V3 400 mW ZENER	MULLARD	BZY88C3V3	2
D62	210033				-
D63	200001	SI GEN PURPOSE	FAIRCHILD	IN4148	-
D64	210120	12V 400mW ZENER	MULLARD	BZY88C12	2
D65	210120	12V 400mW ZENER	MULLARD	BZY88C12	-
D66	200008	SI LOW LEAKAGE	FAIRCHILD	IN458A	-
D67	200008				-
D68	200008	" " "	"	"	-

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
Q1	230001	N CHAN CURRENT LIM	SILICONIX	E506	2
Q2	250008	SIL PNP TRANSISTOR	NATIONAL	BC214C / TO18	2
Q3	250008	SIL PNP TRANSISTOR	NATIONAL	BC214C / TO18	-
Q4	230001	N CHAN CURRENT LIM	SILICONIX	E506	-
Q5	230027	LOW LEAKAGE N-FET	TELEDYNE	U5114	7
Q6	230027	" " "	"	"	-
Q7	230027	" " "	"	"	-
Q8	230027	" " "	"	"	-
Q9	230027	" " "	"	"	-
Q10	230027	" " "	"	"	-
Q11	230027	" " "	"	"	-
Q12	240017	LOW DRIFT DUAL NPN TRANS	NATIONAL	LM394	1
Q13	230002	N-CHAN J FET	TELEDYNE	U1994E	6
Q14	230002	" "	"	"	-
Q15	230002	" "	"	"	-
Q16	230002	" "	"	"	-
Q17		NOT USED			
Q18	230002	N-CHAN J-FET	TELEDYNE	U1994E	-
Q19	230002	" "	"	"	-
Q20	240006	SI NPN	FAIRCHILD	2N3904	5
Q21	240006	"	"	"	-
Q22	240006	"	"	"	-
Q23	240006	"	"	"	-

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
Q24	240014	SI NPN	FAIRCHILD	BC337	2
Q25	250011	SI PNP	"	BC327	2
Q26	250011	" "	"	"	—
Q27	250001	SI PNP	"	BC214	2
Q28	240014	SI NPN	"	BC337	—
Q29	240001	SI NPN	"	BC184	3
Q30	240006	SI NPN	"	2N3904	—
Q31	250004	SI PNP	"	2N3906	1
Q32	240001	SI NPN	"	BC184	—
Q33	240001	SI NPN	"	BC184	—
Q34	250001	SI PNP	"	BC214	—
Q35	230031	N-CHAN DUAL JFET	TELEDYNE	SU2656M	2
Q36	230031	N-CHAN DUAL JFET	TELEDYNE	SU2656M	—

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
M1	220018	HI SPEED OPTO COUPLER	HEWLETT PACKARD	HP4351	4
M2	220017	DUAL OPTO ISOLATOR	FAIRCHILD	FCD880	6
M3	260002	LINEAR IC OP. AMP	"	741HC	2
M4	220018/S61	HI SPEED OPTO COUPLER	HEWLETT PACKARD	HP4351	—
M5	220018/S61	" "			—
M6	220018	"			—
M7	220023	50 CTR DUAL OPTO ISOLATOR	FAIRCHILD	FCD880/50 CTR	1
M8	220017	DUAL OPTO ISOLATOR		FCD880	—
M9	220017				—
M10	220017				—
M11	220017		"		—
M12	280075	DUAL 4 I/P NAND	MOTOROLA	MC14012 BCP	1
M13	280015	QUAD LATCH	MOTOROLA	MC14076 BCP	4
M14	280015	"			—
M15	260029	VOLTAGE COMPARATOR	NATIONAL	LM311 HC	1
M16	280082	HEX INVERTER	FAIRCHILD	F40014 BPC	1
M17	280079	QUAD 2 I/P OR GATE	MOTOROLA	MC14071 BCP	1
M18	280008	QUAD 2 I/P NAND GATE	"	MC14011 BCP	3
M19	280008	" " "			—
M20	280015	QUAD LATCH	"	MC14076 BCP	—
M21	280015	"			—
M22	260035	5534 OP AMP	SIGNETICS	NE5534T	1
M23	220019	DUAL OPTO ISOLATOR	FAIRCHILD	FCD880/SELECTED	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
M24	220017	DUAL OPTO ISOLATOR	FAIRCHILD	FCD880	–
M25	260022	LINEAR IC OP AMP	NATIONAL	LF 355	2
M26	280022	QUAD BILATERAL SWITCH	MOTOROLA	MC14016 BCP	1
M27	280008	QUAD 2 I/P NAND GATE		MC14011 BCP	–
M28	280044	BINARY UP/DOWN COUNTER		MC14516 BCP	1
M29	280011	DUAL D FLIP-FLOP		MC14013 BCP	1
M30	260026	LINEAR IC OP. AMP	NATIONAL	LM212H	2
M31	260022		"	LF 355	–
M32	260026	" " "		LM212H	–
M33	260002	" "	FAIRCHILD	741 HC	–
M34	260013	"	NATIONAL	LF 356 H	1
M35	290081	4051 MUX. SELECTED	DATRON	MC14051 BCL (WHITE)	1
M36	290047	212 OP AMP SELECTED	DATRON	LM212H (GREEN/WHITE)	1
M37		NOT USED			
M38		NOT USED			
M39	260028	DUAL LINEAR IC	FAIRCHILD	μA1458CTC	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
RL1	330003	RELAY 2P2W CROSS BAR	P & B	R10-E1-L2-Q5-BK-(25207)	1
RL2	330012	RELAY REED 1A GUARDED	HAMLIN	HE721A5134	1
	400379/1	WIRE / TERMINAL ASSY			7
	400379/2	" " "			4
	410095-5A	P.C.B			1
	459112	RELAY BRACKET	KDP		1
	540002	22 SWG TINNED COPPER WIRE			A/R
	540008	7/0·2 PTFE INSUL WHITE WIRE			165 mm
	590001	SLEEVE MAX CABLE Ø 3·0	HELLERMANN ELECTRIC	H15 x 20 mm BLK HELSYN	5
	590004	SLEEVE – PTFE	–"– –"–	FE10	90 mm
	590055	SLEEVE Ø 1·0 SIL RUBBER	–"– –"–	H15 CONT. BLACK	250 mm
	602001	F.S.V. TERMINAL	MOLEX	02·04-1875	6
J2,3,4,5	605002	16 WAY DIL SOCKET	JERMYN	A23-2001/Y	4
	605060	14 WAY DIL SOCKET	ASTRALUX	ICL 143-S3T	8
	605061	16 WAY DIL SOCKET	ASTRALUX	ICL 143-S6T	12
J1 & J6	605052	8 WAY POLARISED SOCKET	MOLEX	22-01-2085	2
	605059	8 WAY DIL SOCKET	ASTRALUX	ICL-083-S6T	3
	606005	CLIP FOR 605002	ANTIFERENCE	RC-74	4

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
	611004	SCREW M3 x 6mm POZI PAN	GKN	ZINC PLATED	1
	613005	WASHER M3 INT/SHAKEPROOF st	GKN	" "	1
	615002	NUT M3 FULL HEX STEEL		" "	1
	617010	NYLATCH PLUNGER HN3P	RICHCO	HN3P-32-4-1	8
	617011	" GROMMET HN3G	"	HN3G-32 1	8
	620005	CLOVERLEAF P.T.F.E. TERM.	SEALECTRO	FTE 15 P20	10
	620003	SOLDER PCB TERMINAL LUG	HARWIN	H2105A	4
	630036	STANDARD STEATITE INSUL. BEAD	PARK ROYAL PORCELAIN CO	TYPE N°1 (18 SWG)	6
	615005	NUT 3-48 UNC FULL HEX STEEL.			1
	613014	WASHER M2·5 INT/SHAKEPROOF ST.	GKN DISTRIBUTORS.	ZINC PLATED	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1	000103	10k 5% ¼W CARBON	MULLARD	CR25	21
R2	000103	10k " "	"	"	—
R3	000103	10k " " "	"	"	—
R4	000103	10k " "	"	"	—
R5	000103	10k " " "	"	"	—
R6	000102	1k " "	"	"	9
R7	000103	10k " " "	"	"	—
R8	000472	4k7 " " "	"	"	8
R9	000102	1k " " "	"	"	—
R10	000684	680k " " "	"	"	3
R11	063204	200k POT CERMET	BECKMAN	72P	1
R12	000103	10k 5% ¼W CARBON	MULLARD	CR25	—
R13	000102	1k " " "	"	"	—
R14		NOT USED			—
R15	000472	4k7 5% ¼W CARBON	"	"	—
R16	000332	3k3 " " "	"	"	3
R17	000683	68k " " "	"	"	2
R18	000222	2k2 " " "	"	"	7
R19	000393	39k " " "	"	"	1
R20	000104	100k			15
R21	000104	100k			—
R22	000104	100k " " "	"	"	—
R23	000221	220R " "	"	"	2

NOTES CIRCUIT DIAGRAM = 430329
CHECK PROCEDURE = 460329
CHECK LIST = 470329

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R24	000102	1k 5% ¼W CARBON	MULLARD	CR25	—
R25	000332	3k3 " " "	"	"	—
R26	000103	10k " " "	"	"	—
R27	000102	1k " " "	"	"	—
R28	000682	6k8 " " "	"	"	1
R29	000104	100k " " "	"	"	—
R30		NOT USED			—
R31	000472	4k7 " " "	"	"	—
R32	000472	4k7 " " "	"	"	—
R33	000222	2k2 " " "	"	"	—
R34	000104	100k " " "	"	"	—
R35	000104	100k " " "	"	"	—
R36	000104	100k " " "	"	"	—
R37	000106	10M 10% " "	"	"	1
R38	000104	100k 5% " "	"	"	
R39	000103	10k " " "	"	"	—
R40	000103	10k " " "	"	"	—
R41	000332	3k3 " " "	"	"	—
R42	000103	10k " " "	"	"	—
R43	000104	100k " " "	"	"	—
R44	000103	10k " " "	"	"	—
R45	000334	330k " " "	"	"	2
R46	000472	4k7 " " "	"	"	—

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R47	000103	10k 5% ¼W CARBON	MULLARD	CR25	–
R48	000104	100k " " "	"	"	–
R49	000103	10k " " "	"	"	–
R50	000104	100k " " "	"	"	–
R51	000562	5k6 " " "	"	"	1
R52	000224	220k " " "	"	"	1
R53	000123	12k " " "	"	"	1
R54	000105	1M " " "	"	"	1
R55	000684	680k " " "	"	"	–
R56	000104	100k " " "	"	"	–
R57		NOT USED			–
R58	000100	10R " " "	"	"	2
R59	000220	22R " " "	"	"	2
R60	000220	22R " " "	"	"	–
R61	000100	10R " " "	"	"	–
R62		NOT USED			–
R63	000222	2k2 5% ¼W CARBON	MULLARD	CR25	–
R64	000222	2k2 " " "	"	"	–
R65	000103	10k " " "	"	"	–
R66	000103	10k " " "	"	"	–
R67	000271	270R " " "	"	"	1
R68	000103	10k " " "	"	"	–
R69	000561	560R " " "	"	"	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R70	000222	2k2 5% ¼W CARBON	MULLARD	CR25	–
R71	000102	1k " " "	"	"	–
R72	000221	220R " " "	"	"	–
R73	000102	1k " " "	"	"	–
R74	000124	120k " " "	"	"	1
R75	000471	470R " " "	"	"	1
R76	000824	820k " " "	"	"	1
R77		NOT USED			–
R78		NOT USED			–
R79	000472	4k7 " " "	"	"	–
R80	000683	68k " " "	"	"	–
R81	000183	18k " " "	"	"	1
R82	000334	330k " " "	"	"	–
R83	063202	2k POT CERMET	BECKMAN	72 P	1
R84	000223	22k 5% ¼W CARBON	MULLARD	CR25	1
R85	000472	4k7 " " "	"	"	–
R86		NOT USED			–
R87	000104	100k			–
R88	000103	10k " " "	"	"	–
R89	000103	10k " " "	"	"	–
R90		NOT USED			–
R91	012002	20k0 1% ⅛W 50ppm MF	HOLCO	H8C	1
R92	015231	5k23 " " "	"	"	1

NOTES

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TITLE 1061 DIGITAL PCB. ASSY.

DRAWING NUMBER 400329

SHEET 5 OF 16

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R93		NOT USED			–
R94	000102	1k 5% ¼W CARBON	MULLARD	CR25	–
R95	000472	4k7 " "	"	"	–
R96	000103	10k " " "	"	"	–
R97	000222	2k2 " " "	"	"	–
R98		NOT USED			–
R99	000104	100k 5% ¼W CARBON	"	"	–
R100	000104	100k " "	"	"	–
R101	000684	680k " "	"	"	–
R102	000103	10k " " "	"	"	–
R103	000222	2k2 " "	"	"	–
R104	000102	1k " "	"	"	–
AN1	090046	10k × 7 2% NETWORK	BECKMAN	764-1-R10k	5
AN2		NOT USED			–
AN3	090046	10k × 7 2% NETWORK	BECKMAN	764-1-R10K	–
AN4	090042	8 BIT 'R-2R' LADDER NETWORK	SEE DRG		1
AN5	090046	10k × 7 2% NETWORK	BECKMAN	764-1-R10K	–
AN6	090046	10k × 7 2% NETWORK	BECKMAN	764-1-R10K	–
AN7	090046	10k × 7 2% NETWORK	BECKMAN	764-1-R10K	–

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SHEET 6 OF 16

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C1	150002	10µF 20% 16v DIP TANT	UNION CARBIDE	K10E16	14
C2	150002	10µF " " " "	" "	"	–
C3	150002	10µF " " " "	" "	"	–
C4	150016	1 µF " 35v " "	" "	K1R0E35	7
C5	110013	·1 µF 10% 250v POLYESTER	MULLARD	C280AE/P100k	3
C6	101103	·01µF 250v CER DISC	ERIE	801	6
C7	150006	4·7µF 20% 16v DIP TANT	UNION CARBIDE	K4R7E16	1
C8		NOT USED			–
C9	150002	10µF 20% 16v DIP TANT	UNION CARBIDE	K10E16	–
C10	102101	100pF 500v CER DISC	ERIE	801	5
C11	150002	10µF 20% 16v DIP TANT	UNION CARBIDE	K10E16	–
C12	150016	1µF " 35v " "	" "	K1R0E35	–
C13	150002	10µF " 16v " "	" "	K10E16	–
C14	110013	0·1µF 10% 250v POLYESTER	MULLARD	C280AE/P100K	–
C15	150002	10µF 20% 16v DIP TANT	UNION CARBIDE	K1R0E16	–
C16	102221	220pF 500v CER DISC	ERIE	801	3
C17	150002	10µF 20% 16v DIP TANT	UNION CARBIDE	K10E16	–
C18	150002	10µF " " " "	" "	"	–
C19	150016	1µF " 35v " "	" "	K1R0E35	–
C20	150002	10µF " " " "	" "	K10E16	–
C21	102101	100pF 500v CER DISC	ERIE	801	–
C22	101103	·01µF 250v CER DISC	ERIE	801	–
C23	120016	2n2F 20% 100v POLYCARD	WIMA	FKC 2MIN	1

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SHEET 7 OF 16

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C24	130016	130pF 2½% 25v POLYSTYRENE	SOFLEX	HSQ130/2½ - 7/25	1
C25	102471	470pF 500v CER DISC	ERIE	801	2.
C26	150016	1µF 20% 35v DIP TANT	UNION CARBIDE	KIROE35	-
C27	150002	10µF " 16v " "		K10E16	-
C28	102220	22pF 500v CER DISC	ERIE	801	3
C29	150016	1µF 20% 35v DIP TANT	UNION CARBIDE	KIROE35	-
C30	150002	10µF 20% 16V " "	"	K10E16	-
C31	110005	·01µF 10% 250v POLYESTER	MULLARD	C280AE/P10K	1
C32	110003	·068µF			1
C33	150014	·68µF 20% 35v DIP TANT	UNION CARBIDE	KR68E35	1
C34	101103	·01µF 250v CER DISC	ERIE	801	-
C35	150002	10µF 20% 16v DIP TANT	UNION CARBIDE	K10E16	-
C36	101103	·01µF 250v CER DISC	ERIE	801	-
C37	102220	22pF 500v CER DISC		"	-
C38	102221	220pF 500v " "	"	"	-
C39	101103	·01µF 250v " "	"	"	-
C40	110013	·1µF 10% 250v POLYESTER	MULLARD	C280AE/P100k	-
C41	110027	3n3F 20% 100V POLYESTER	WIMA	FKS2MIN	1
C42	102471	470pF 500v CER DISC	ERIE	801	-
C43	102101	100pF 500v CER DISC	"	801	-
C44	150002	10µF 20% 16v DIP TANT	UNION CARBIDE	K10E16	-
C45	150016	1µF 20% 35v " "	" "	KIROE35	-
C46	102220	22pF 500v CER DISC	ERIE	801	-

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SHEET 8 OF 16

IW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C47	150004	100µF 20% 6V3 DIP. TANT.	UNION CARBIDE	K100E6V3	1
C48		NOT USED			-
C49	101103	·01µF 250v CER. DISC	ITT	CD10	-
C50	102101	100pF 500v CER. DISC	ITT	801	-
C51	102101	100pF 500v CER. DISC	ITT	801	-
C52		NOT USED			-
C53	102221	220pF 500v CER. DISC	ERIE	801	-
C54	130008	68pF 5% 160v POLYSTYRENE	SUFLEX	HS	1
C55	150016	1µF 20% 35v DIP. TANT	UNION CARBIDE	K10E16	-

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SHEET 9 OF 16

IW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
D1	200001	75mA 75v GP. Si DIODE	FAIRCHILD	IN4148	10
D2	200001	75mA 75v GP. Si. DIODE	FAIRCHILD	IN4148	—
D3	200001	75mA 75v GP. Si. DIODE	FAIRCHILD	IN4148	—
D4	200001	75mA 75v GP. Si. DIODE	FAIRCHILD	IN4148	—
D5	200008	200mA 125v LL Si DIODE	FAIRCHILD	IN458A	1
D6	220010	Si HOT CARRIER DIODE	HP	HSCH1001/IN6263	1
D7	210027	2V7 400mW ZENER	MULLARD	BZY88C2V7	1
D8	210033	3V3 400mW ZENER	MULLARD	BZY88C3V3	1
D9	220022	DUAL 37pF VARICAP DIODE	THOMPSON – CSF	BB204B	2
D10	200001	75mA 75v GP. Si DIODE	FAIRCHILD	IN4148	—
D11	200001	75mA 75v GP. Si. DIODE	FAIRCHILD	IN4148	—
D12	200002	1A. 50v. GP. Si. DIODE	FAIRCHILD	IN4001	2
D13	213006	5V 5W ZENER	UNITRODE	TVS 505	1
D14	200001	75mA 75v GP. Si. DIODE	FAIRCHILD	IN4148	—
D15	200001	75mA 75v GP. Si. DIODE	FAIRCHILD	IN4148	—
D16	200002	1A. 50v. GP. Si. DIODE	FAIRCHILD	IN4001	—
D17	200001	Si GP. DIODE	FAIRCHILD	IN4148	—
D18		NOT USED			—
D19		NOT USED			—
D20	220022	DUAL 37pF VARICAP DIODE	THOMPSON – CSF	BB 204 B	—
D21	200001	75mA 75v GP. Si. DIODE	FAIRCHILD	IN4148	—

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SHEET 10 OF 16

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
Q1	240001	Si NPN TRANSISTOR	NATIONAL	BC184	5
Q2	240001	" " "	"	"	—
Q3	240007	" " "	"	2N3646	2
Q4		NOT USED			—
Q5	240006	Si NPN TRANSISTOR	NATIONAL	2N3904	2
Q6	250004	Si PNP "	"	2N3906	3
Q7	250004	" " "	"	"	—
Q8	240001	" NPN "	"	BC184	—
Q9	240001	" " "	"	"	—
Q10	250001	" PNP "	"	BC214	1
Q11					—
Q12	250011	" PNP "	"	BC327	1
Q13	240007	" NPN "	"	2N3646	—
Q14	240001	" " "	"	BC184	—
Q15	240006	" " "	"	2N3904	—
Q16	250004	" PNP "	"	2N3906	—
Q17	250008	" " "	"	BC214KC	1

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SHEET 11 OF 16

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
M1	280011	DUAL D FLIP-FLOP	MOTOROLA	MC14013 BCP	2
M2	280022	QUAD BILATERAL SWITCH		MC14016 BCP	1
M3	280024	TRI-STATE HEX NON-INV BUFFER		MC14503 BCP	7
M4	280024	" " " "		"	–
M5	280024	" " "		"	–
M6	280024	" " "		"	–
M7	280015	QUAD LATCH		MC14076 BCP	5
M8	280015	" "		"	–
M9	280015	" "	"	"	–
M10	280024	TRI-STATE HEX NON-INV BUFFER	"	MC14503 BCP	–
M11	280015	QUAD LATCH	"	MC14076 BCP	–
M12	280015	" "	"	"	–
M13	280044	BINARY UP/DOWN COUNTER		MC 14516 BCP	4
M14	280044	" " " "	"	"	–
M15	290003	TIMER – ASTABLE	SIGNETICS	NE 555V	3
M16	270058	DUAL 1-of-4 DECODER	NATIONAL	74 LS155	2
M17	270048	QUAD 2 I/P NAND GATE	NATIONAL	74 LS00	2
M18		NOT USED			–
M19	280066	256 × 4 BIT STATIC CMOS RAM	SEE DRAWING		4

NOTES

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TITLE 1061 DIGITAL PCB. ASSY

DRAWING NUMBER 400329 SHEET 12 OF 16

J.W. 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
M20	280066	256 × 4 BIT STATIC CMOS RAM	SEE DRAWING		–
M21, M21A	280037	HEX BUFFER	MOTOROLA	MC14050 BCP	12
M22	280011	DUAL D FLIP-FLOP	"	MC14013 BCP	–
M23	270053	A-D CHIP	FERRANTI	ZNA 2035	1
M24	280024	TRI-STATE HEX. NON-INV. BUFFER	MOTOROLA	MC14503 BCP	–
M25	280024	" " " " " "	"	"	–
M26	280006	DUAL J-K FLIP-FLOP	"	MC14027 BCP	1
M27	280004	14 BIT BINARY COUNTER	"	MC 14020 BCP	1
M28	270051	DUAL 4 I/P AND GATE	NATIONAL	74 LS21	2
M29	270055	DUAL 4 I/P NAND GATE	"	74 LS20	2
M30	290057/SU-3A	4k × 8 EPROM - SEE PROG. SPEC		TMS 2532 JL/PROGRAM'D	1
M31	280066	256 × 4 BIT STATIC CMOS RAM	SEE DRAWING		–
M32	270058	DUAL 1-of-4 DECODER	NATIONAL	74 LS155	–
M33	270051	DUAL 4 I/P AND GATE	"	74 LS 21	–
M34	270055	DUAL 4 I/P NAND GATE	"	74 LS 20	–
M35	290056/SU-3A	4k × 8 EPROM - SEE PROG. SPEC		TMS 2532 JL/PROGRAM'D	1
M36	280066	256 × 4 BIT STATIC CMOS RAM	SEE DRAWING		–
M37	280025	QUAD BILATERAL SWITCH	MOTOROLA	MC 14066 BCP	2
M38	280071	TRIPLE 3 I/P NOR GATE	MULLARD	HEF 4025 P	2
M39	280017	HEX INVERTER	MOTOROLA	MC14069 BCP	1
M40	280083	QUAD 2 I/P NOR GATE	MULLARD	HEF 4001 BP	1
M41	280044	BINARY UP/DOWN COUNTER	MOTOROLA	MC14 516 BCP	–
M42	280003	QUAD LATCH	"	MC14042 BCP	2

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J.W. 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
M43	290003	TIMER - ASTABLE	SIGNETICS	NE 555V	—
M44	270048	QUAD 2 I/P NAND GATE	NATIONAL	74LS00	—
M45	270050	HEX INVERTER	"	74LS04	1
M46	280025	QUAD BILATERAL SWITCH	MOTOROLA	MC14066BCP	—
M47	280070	DIVIDE-BY-8 COUNTER/DIVIDER	MULLARD	HEF 4022P	1
M48	280071	TRIPLE 3 I/P NOR GATE	"	HEF 4025P	—
M49	280023	QUAD 2 I/P NOR GATE	MOTOROLA	MC14001 BCP	1
M50	280044	BINARY UP/DOWN COUNTER	"	MC14516 BCP	—
M51	280003	QUAD LATCH	"	MC 14042 BCP	—
M52	270056	8 I/P NAND GATE	NATIONAL	74LS30	1
M53	280061	MICRO PROCESSOR CHIP	MOTOROLA	MC 6800L	1
M54	270023	QUAD 2 I/P NAND GATE	NATIONAL	7437	1
M55	270054	QUAD 2 I/P AND GATE	"	74LS08	2
M56	270054	" " " "	"	"	—
M57	270057	DUAL JK FLIP-FLOP	"	74LS76	1
M58	280009	HEX INVERTER/BUFFER	MOTOROLA	MC14049	2
M59	280009	HEX INVERTER/BUFFER	MOTOROLA	MC14049	—
M60, M62	260031	VOLTAGE DETECTOR	INTERSIL	ICL8211	2
M61	290003	TIMER - ASTABLE	SIGNETICS	NE555V	—
S1		NOT USED			—
S2		NOT USED			—
S3		NOT USED			—

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
L1	370003	1000μH 40Ω R.F. CHOKE	SIGMA	SC10/1000	1
L2	370002	100μH ·40Ω " "	TOKO	YXRS 18576	1
	590004	SLEEVE - PTFE	HELLERMAN ELECTRIC	FE10	A/R
TP1-TP33, LINKS	540002	22 SWG. BTC WIRE			A/R
	920048	BUS STRIP	MEKTRON	M823 14 7.3F	1
	590055	SLEEVE Ø1·0 SIL. RUBBER	HELLERMAN ELECTRIC	H15 CONT. BLACK	10 mm
	630098	COMPONENT CLIP	RICHCO	KKU-8	1
	606005	CLIP FOR 605002	ANTIFERENCE	RC 74	3
J1, J2, J4	605002	16 WAY D.I.L. LOW PROFILE SKT.	JERMYN OR ANTIFERENCE	A23-2001/Y OR ICN-163-S3	3
	605065	28 WAY D.I.L. " " "	AUGAT	328-AG39D	1
	605060	14 WAY D.I.L. SOCKET	ASTRALUX OR JERMYN	ICL 143-S3T	21
	605061	16 WAY D.I.L. SOCKET	" "	ICL 163-S6T	30
	605050	40 WAY D.I.L. SOCKET	AUGAT	340-AG39D	1
	605063	22 WAY D.I.L. SOCKET	AUGAT	322-AG39D	4
J3	605064	24 WAY D.I.L. SOCKET	"	324-AG39D	3
JL3	604037	PROGRAMMING CLASS 160 PLUG	"	8136-475G8	1
	605059	8 WAY D.I.L. SOCKET	ASTRALUX	ICL-083-S6T	1
J5	605052	8 WAY POLARISED SOCKET	"	22-01-2085	1
	617010	NYLATCH PLUNGER	ORDER FROM G.J FOX & SONS	HN3P-32-4-1	8
	617011	NYLATCH GROMMET	" " " "	HN3G-32-1	8
	410096-7A	PCB			1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
	400379/1	WIRE/TERMINAL ASSY			8
J6		NOT USED			–
J7		NOT USED			–
	620003	SOLDER PCB TERMINAL LUG	HARWIN	H2105A	5

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SHEET 16 OF 16

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1	000472	4k7 5% ¼W CARBON	MULLARD	CR25	3
R2	000103	10k "	"	"	2
R3	000183	18k " "	"	"	1
R4	000103	10k " "	"	"	–
R5	000104	100k "	"	"	1
R6		NOT USED			–
R7		NOT USED			–
R8	000102	1k 5% ¼W CARBON	MULLARD	CR25	19
R9	000102	1k " " "	"	"	–
R10	000102	1k " " "	"	"	–
R11	000102	1k " " "	"	"	–
R12	000102	1k " " "	"	"	–
R13	000102	1k " " "	"	"	–
R14	000102	1k " " "	"	"	–
R15	000102	1k " "	"	"	–
R16		NOT USED			–
R17		NOT USED			–
R18	000102	1k " "	"	"	–
R19	000102	1k " " "	"	"	–
R20	000102	1k " " "	"	"	–
R21		NOT USED			–
R22	000272	2k7 5% ¼W CARBON	"	"	5
R23	000472	4k7 " " "		"	–

NOTES CIRCUIT DIAGRAM = 430330
CHECK PROCEDURE = 460330
CHECK LIST = 470330

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ISS	C	1	2	3	4	5	6
ECN	–	–	789	822	854	904	1008 1025
DATE	2.5.78	29.9.78	17 Nov 78	20 FEB 79	10-MAY 79	21.6.79	3-1-80
CHKD	–		MSD				

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TITLE 1061 DISPLAY DRIVER
PCB. ASSY

DRAWING NUMBER 400330 SHEET 2 OF 7

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R24	000272	2k7 5% ¼W CARBON	MULLARD	CR25	–
R25	000272	2k7 " " "	"	"	–
R26	000272	2k7 " " "	"	"	–
R27	000182	1k8 " "	"	"	1
R28	000222	2k2 " " "	"	"	1
R29	000272	2k7 " " "	"	"	–
R30	000102	1k " " "	"	"	–
R31	000102	1k " " "	"	"	–
R32	000102	1k " " "	"	"	–
R33	000102	1k " " "	"	"	–
R34	000102	1k " " "	"	"	–
R35	000102	1k " " "	"	"	–
R36	000102	1k " " "	"	"	–
R37	000102	1k " " "	"	"	–
R38	000472	4k7 " " "	"	"	–
R39	000393	39k " " "	"	"	1
R40		NOT USED			–
R41	000563	56K 5% ¼W CARBON	MULLARD	CR25	1
C1	150020	10µF 20% 25v DIP TANT	UNION CARBIDE	K10E25	3
C2		NOT USED			–
C3		NOT USED			–

NOTES

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TITLE 1061 DISPLAY DRIVER
PCB. ASSY

DRAWING NUMBER 400330 SHEET 3 OF 7

[illegible]		[illegible]	PRINCIPAL MANUFACTURER	MANUFACTURERS PART No	No USED Per Assy
C4	110013	0·1µF 20% 250v POLYESTER	MULLARD	C280 AE/P100K	8
C5	110013	" " "	"	"	-
C6	110013	" " " "	"	"	-
C7	110013	" " " "		"	-
C8	110013	" "			-
C9	110013	" " "	"		-
C10	110013	" " "			-
C11	110013	" " " "			-
C12		NOT USED			-
C13	110005	0·01µF 20% 250v "	"	C280 AE/P10K	3
C14	150020	10µF 20% 25v. DIP. TANT	UNION CARBIDE	K10E25	-
C15	110005	0·01µF 20% 250v POLYESTER	MULLARD	C280 AE/P10K	-
C16	110005	0·01µF 20% 250v POLYESTER	MULLARD	C280 AE/P10K	-
C17	150020	10µF 20% 25v DIP. TANT	UNION CARBIDE	K10E25	-
C18	180019	10µF 20% 250v AL ELECT	ITT	JF10-1006 250AA	1
D1		NOT USED			-
D2		NOT USED			-
D3		NOT USED			-
D4	200001	DIODE Si GP	FAIRCHILD	IN4148	8
D5	200001	" " "	"	"	-
D6	200001	" " "	"	"	-

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1061 DISPLAY DRIVER PCB ASSY

400330 4 7

			PRINCIPAL MANUFACTURER	MANUFACTURERS PART No	No USED Per Assy
D7	200001	DIODE Si GP	FAIRCHILD	IN4148	-
D8	200001	" "	"	"	-
D9	200001	" " "	"	"	-
D10	200001	" " "	"	"	-
D11	200001	" " "	"	"	-
D12	213005	DIODE ZENER 75V. ½W	MOTOROLA	BZX79C75	1
Q1	250009	Si PNP TRANSISTOR	NATIONAL	2N5401	11
Q2	250009	" " "	"	"	-
Q3	250009	" " "	"	"	-
Q4		NOT USED			-
Q5	240009	Si NPN TRANSISTOR	"	MPS L01	8
Q6	240009	" " "	"	"	-
Q7	240009	" " "	"	"	-
Q8	240009	" "	"	"	-
Q9	240009	" " "	"	"	-
Q10	240009	" " "	"	"	-
Q11	240009	" " "	"	"	-
Q12	240009	" " "	"	"	-
Q13	250009	" PNP "	"	2N5401	-
Q14	250009	" " "	"	"	-
Q15	250009	" "	"	"	-
Q16	250009	" "	"	"	-

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TITLE 1061 DISPLAY DRIVER PCB ASSY.

DRAWING NUMBER 400330 SHEET 5 OF 7

DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
Q17	250009	Si PNP TRANSISTOR	NATIONAL	2N5401	–
Q18	250009	" " "	"	"	–
Q19	250009	" " "	"	"	–
Q20	250009	" " "	"	"	–
M1	280062	128 × 8 BIT STATIC RAM	MOTOROLA	MC 6810	1
M2		NOT USED			–
M3		NOT USED			–
M4	280023	QUAD 2 I/P NOR GATE	"	MC 14001 BCP	2
M5	280023	QUAD 2 I/P NOR GATE	"	"	–
M6	280024	TRI-STATE HEX NON-INV BUFFER	"	MC 14503 BCP	2
M7	280024	" " " " "	"	"	–
M8	280059	DUAL BINARY UP COUNTER	"	MC 14520 BCP	1
M9	270045	QUAD 2-1 DATA SELECT LS TTL	NATIONAL	SN74 LS157	1
M10		NOT USED			–
M11	280043	4 BIT LATCH/4 TO 16 LINE DECODER	MOTOROLA	MC14515 BCP	1
M12	270048	QUAD 2 I/P NAND LS TTL	NATIONAL	SN74 LS00	1
M13	280077	HEX GATE	MOTOROLA	MC14572	1
AN2 - AN4	090065	330K×7 2% RESISTOR NETWORK	BECKMAN	764-1-R330K	3

NOTES

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DRAWING NUMBER 400330
SHEET 6 OF 7

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
J1	605002	16 WAY DIL LOW PROFILE SKT.	JERMYN OR ANTIFERENCE	A23-2001/Y OR ICN-163-S3	1
J2	605064	24 WAY DIL.SKT. TIN PLATE	AUGAT	324 - AG39D	3
	605037	14 WAY DIL SOCKET	ASTRALUX OR JERMYN	ICL 143 - S37	3
	605038	16 WAY DIL SOCKET	" "	ICL 163 - S6T	5
	605064	24 WAY DIL. SKT. TIN PLATE	AUGAT	324 - AG39D	–
TP1 - TP6	540002	22 SWG BTC WIRE			A/R
	590004	SLEEVE - PTFE	HELLERMANN ELECTRIC	FE10	A/R
	410097-5A	PCB			1
	617010	NYLATCH - PLUNGER	ORDER FROM C.J. FOX & SONS	HN3P-32-4-1	4
	617011	NYLATCH - GROMMET	" " " "	HN3G-32-1	4
	606005	CLIP FOR SOCKET 605002	ANTIFERENCE	RC-74	1

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DRAWING NUMBER 400330
SHEET 7 OF 7

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1		NOT USED			
R2	090001	PTC THERMISTOR	MULLARD	VA8650	2
R3	090044	4M0 1% MF	ACI		(1SET) R3 R4
R4		3K94 1% MF	ACI		–
R5	000106	10M 5% ¼W CARBON	MULLARD	CR25	5
R6	000392	3K9 "	"	"	2
R7	000106	10M " "	"	"	–
R8	019761	9K76 1% 50ppm M.F	HOLCO	H8	1
R9	090001	PTC THERMISTOR	MULLARD	VA8650	–
R10		NOT USED			–
R11	000106	10M 5% ¼W CARBON	MULLARD	CR25	–
R12	000563	56K " " "	"	"	2
R13	000563	56K " " "	"	"	–
R14	000 04	100K "	"	"	6
R15	000243	24K " "	"	"	1
R16	000682	6K8 " "	"	"	1
R17	000103	10K " "	"	"	3
R18	000107	100M " "	"	"	1
R19	000104	100K	"		–
R20	041505	15M 1% 100ppm CF	ALLEN BRADLEY	CC	2
R21	041505	15M "		"	–
R22	000222	2K2 5% ¼W CARBON	MULLARD	CR25	2
R23	000391	390R " " "	"	"	1

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ECO	RELEASED	ECO840	ECO857	895/909 904	933,930	960 972 981	1000 1028	1054 1062	1109	1115.1124	1134	1176
DATE	5-12-78	27-2-79	4.5.79	20-6-79	13-7-79	25-10-79	3-1-80	6 FEB80	18.4.80	3.6.80	20.6.80	12.12.80
CHKD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD	MD

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TITLE 1061 OHMS P.C.B ASSY
DRAWING NUMBER 400331
SHEET 2 OF 12

W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R24	070093	57K77 0·1% WIREWOUND.	MANN		1
R25	070094	577K7 0·1% WIREWOUND.	MANN		1
R26	063204	200k POT CERMET	BECKMANN	72 P	2
R27	063204	200K " "	"	"	–
R28	000105	1M 5% ¼W CARBON	MULLARD	CR25	4
R29	070082	5K777 0·1% WIREWOUND	MANN		1
R30	070091	1K2839 0·1% WIREWOUND	MANN		2
R31	070091	1K2839 0·1%			–
R32	000332	3K3 5%. ¼W CARBON	MULLARD	CR25	1
R33	000154	150K 5% ¼W CARBON	MULLARD	CR25	1
R34	000681	680R " "		"	1
R35	000106	10M 5% ¼W CARBON	MULLARD	CR 25	–
R36	041005	10M 1% 100ppm CF	ALLEN BRADLEY	CC	1
R37	090049	18M } MATCHED PAIR	HOLCO		1 PAIR
R38		8M			–
R39		FSV			–
R40		F.S.V			–
R41	000473	47K 5% ¼W CARBON	MULLARD	CR25	3
R42	000624	620K " " "	"	"	1
R43	000473	47K " " "		"	–
R44	000102	1K " " "		"	2
R45	000102	1K " " "	"	"	–
R46	000562	5K6 " "	"	"	2

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SHEET 3 OF 12

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R47	000473	47K 5% ¼W CARBON	MULLARD	CR25	-
R48	000823	82K			2
R49	000392	3K9			-
R50	000562	5K6 "			-
R51	000105	1M			-
R52	000104	100K "			-
R53	000273	27K " "			2
R54	000104	100K "			
R55	000105	1M			-
R56	000824	820K "			1
R57	000104	100K "			-
R58	000273	27K "			-
R59	000104	100K			-
R60	000123	12K			1
R61	000334	330K			1
R62	000222	2K2			-
R63	000223	22K			1
R64	000333	33K			2
R65	000272	2K7			1
R66	000105	1M "		"	-
R67	000474	470K " "		"	1
R68	000124	120K " "		"	1
R69	000103	10K "		"	-

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J.W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R70	000221	220R 5% ¼W CARBON	MULLARD	CR25	1
R71	000103	10k 5% ¼W CARBON	MULLARD	CR25	—
R72	000333	33k 5% ¼W CARBON	MULLARD	CR25	—
R73	000823	82k 5% ¼W CARBON	MULLARD	CR25	—
R74	000106	10M 5% ¼W CARBON	MULLARD	CR25	—
AN1	09 0017	100k × 7 2% NETWORK	BECKMAN	764-1-R100k	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C1	120028	4700pF 20% 100V POLYCARB	WIMA	FKC-2 MIN	1
C2	120026	680pF 20% 100V POLYCARB	WIMA	FKC-2 MIN	1
C3	102470	47pF 500V CER DISC	ERIE	801	2
C4	102470	47pF 500V CER DISC	ERIE	801	–
C5	102222	2n2F 500V CER DISC	ERIE	801	1
C6	101103	·01μF 250V CER DISC	ERIE	801	4
C7	120022	1nSF 20% 100v POLYCARB	WIMA	FKC2 MIN	1
C8	120014	2·2μF 10% 63V POLYCARB	ASHCROFT	A2B2221B	2
C9	120014	2·2μF			–
C10	110013	0·1μF 10% 250V POLYESTER	MULLARD	C280AE/P100K	2
C11	150001	22μF 20% 16V DIP TANT	UNION CARBIDE	K22E16	2
C12	101103	·01μF 250V CER DISC	ERIE	801	–
C13	150001	22μF 20% 16V DIP TANT	UNION CARBIDE	K22E16	–
C14	101103	·01μF 250V CER DISC	ERIE	801	–
C15	102100	10pF 500V CER DISC		"	2
C16	102100	10pF " "	"	"	–
C17	102102	1nF "			1
C18	120021	0·47μF 10% 63V POLYCARB	ASHCROFT	A2B4711B	1
C19	150014	680nF 20% 35V DIP TANT	UNION CARBIDE	KR68E35	1
C20	150016	1μF 20% 35V DIP TANT	UNION CARBIDE	K1R0E35	1
C21	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	2
C22	101103	·01μF 250V CER DISC	ERIE	801	–
C23	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	–

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SHEET 6 OF 12

J.W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
C24	102101	100pf 10% 500V CER DISC	I.T.T	CD10	3
C25	102101	100pf " " " "	"	"	–
C26	102101	100pF " " " "	"	"	–
C27	110013	100nF 20% 250v POLYESTER	MULLARD	C280AE/P100k	–
D1	213001	10V 5W ZENER	MOTOROLA	IN5347	4
D2	213001	10V " "		"	–
D3		NOT USED			
D4		NOT USED			
D5		NOT USED			
D6		NOT USED			
D7	210027	2V7 400mW ZENER	MULLARD	BZY88C2V7	1
D8	200001	Si G P	FAIRCHILD	IN4148	11
D9		NOT USED			
D10	213001	10V 5W ZENER	MOTOROLA	IN5347	–
D11	213001	10V " "		"	–
D12	200001	Si G P	FAIRCHILD	IN4148	–
D13		NOT USED			
D14	200008	Si LOW LEAKAGE	FAIRCHILD	IN458A	3
D15	200008	Si " "	"	"	–
D16	210075	7V5 400mW ZENER	MULLARD	BZY88C7V5	1
D17	210120	12V 400mW ZENER	"	BZY88C12	1

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DRAWING NUMBER 400331
SHEET 7 OF 12

J.W 1164

DESIGNATION	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER PART No	No USED Per Assy
D18	20000	SI G P	FAIRCHILD	IN4148	
D19	20000	S		"	
D20	20000	S			
D2	20000	SI			
D22	20000	S			
D23	20000	S			
D24		NOT USED			
D25	200001	S			
D26	20000	S			
D27	200001	SI GP		"	
D28	200008	SI LOW LEAKAGE		IN458A	–
Q	230027	N-CHAN J FET SELECTED	TELEDYNE	U3114E	7
Q2	230027				
Q3	230027				
Q4	230027				
Q5	230002	N CHAN J FET	SILICONIX	U1994E	6
Q6	230027	N CHAN J FET SELECTED	TELEDYNE	U3114E	
Q7	230027			"	
Q8	230002	N-CHAN J FET	SILICONIX	U1994E	–
Q9	230002			"	–
Q10	2400 7	SI NPN SUPERMATCH PAIR	NATIONAL	LM394	1
Q1	230029	N-CHAN J FET	SILICONIX	J309	4

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TITLE 1061 OHMS PCB ASSY

DRAWING NUMBER 400351

SHEET 8 OF 12

DESIGNATION	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
Q12		NOT USED			
Q13	2400 2	SI NPN	NATIONAL	2N3053	1
Q14	230027	N-CHAN J FET	TELEDYNE	U3114E	–
Q15	25000	SI PNP	NATIONAL	BC214	2
Q16	250011	SI PNP	NATIONAL	BC327	1
Q17	24000	SI NPN	NATIONAL	BC184	2
Q18	24000	SI NPN	NATIONAL	BC184	–
Q19	250001	SI PNP	NATIONAL	BC214	–
Q20	230002	N-CHAN J FET	SILICONIX	U1994E	–
Q21	230029	N-CHAN J FET	SILICONIX	J309	–
Q22	230029	N-CHAN J FET	SILICONIX	J309	–
Q23	230002	" "		U1994E	–
Q24	230002				–
Q25	230029	" "		J309	–

NOTES

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SHEET 9 OF 12

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
M1	280022	QUAD BILATERIAL SWITCH	MOTOROLA	MC 14016 BCP	2
M2	280022	" "			–
M3	260022	OP AMP	NATIONAL	LF 355	1
M4	260026	OP AMP	NATIONAL	LM 212	1
M5	280025	QUAD ANALOGUE SWITCH	MOTOROLA	MC 14066 BCP	1
M6	280072	MSTABLE / ASTABLE M'VIBR	R C A	CD 4047 AE	1
M7	280015	QUAD LATCH	MOTOROLA	MC 14076 BCP	2
M8	280015	" "	"	"	–
M9	280011	DUAL D FLIP FLOP	MOTOROLA	MC 14015 BCP	1

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JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
RL1 (1)	330001	RELAY 4P 2W CROSSBAR	P&B	R10-E1-L4-Q2-5K	1
	400379/2	WIRE / TERMINAL ASSY			6
	410099-6	OHMS PCB			1
	459112	RELAY BRACKET	KDP		1
	540008	7/0·2 PTFE INSULATED WHITE.		TYPE C	280mm.
	540002	22 SWG TINNED COPPER WIRE			A/R
	59000	SLEEVE MAX CABLE Ø 3 0	HELLERMANN ELECTRIC	H15 x 20mm BLK HELSYN	9
	590055	SLEEVE Ø1·0 SIL. RUBBER	HELLERMANN ELECTRIC	H15 CONT. BLACK	20mm
	571110/8	16 WAY RIBBON CABLE ASSY	3M		1
	60200	FSV TERMINAL	MOLEX	02-04-1875	4
	605002	16 WAY DIL LOW PROFILE SKT	JERMYN or ANTIFERENCE	A23-2004/Y or ICN-163-S3	1
	605060	14 WAY DIL SOCKET	ASTRALUX	ICL-143-S3T	5
	605061	16 WAY DIL SOCKET	ASTRALUX	ICL-163-S6T	2
J1	605053	12 WAY POLARISED SOCKET	MOLEX	22-01-2125	1

NOTES (1) ALTERNATIVE RELAY 330016 (OMRON) — USE M2·3 FULL HEX NUT 615014. (CHALLENGE IND FASTENERS)

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TITLE 1061 OHMS PCR ASSY

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JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
	606005	CLIP FOR 605002	ANTIFERENCE	RC-74	1
	611004	SCREW M3x6mm STEEL POZIPAN ZINC PLATED	.GKN		1
	613005	WASHER M3 INT/SHAKEPROOF	GKN DISTRIBUTORS	ZINC PLATED	2
	615002	NUT M3 FULL HEX STEEL		ZINC PLATED	1
	615005	NUT 3-48 UNC FULL HEX	STEEL	" "	1
	617010	NYLATCH PLUNGER HN3P	ORDER FROM C J FOX & SONS	HN3P-32-4-1	4
	617011	NYLATCH GROMMET HN3G		HN3G-32-1	4
	618002	TO5 MOUNTING PAD	JERMYN	TO518-004D	1
	620003	SOLDER PCB TERMINAL LUG	HARWIN	H2105A	8
	630024	STANDARD STEATITE INSUL BEAD	PARK ROYAL PORCELAIN Co	TYPE No 2 (16 SWG)	8

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SHEET 12 OF 12

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1	000103	10k 5% ¼W CARBON	MULLARD	CR25	1
R2	000104	100k 5% ¼W CARBON	MULLARD	CR25	4
R3	000104	100k 5% ¼W CARBON	MULLARD	CR25	–
R4	000104	100k 5% ¼W CARBON	MULLARD	CR25	–
R5	000104	100k 5% ¼W CARBON	MULLARD	CR25	–
AN1	090017	100k ×7 2% NETWORK	BECKMAN	764-1-R100k	2
AN2	090017	100k ×7 2% NETWORK	BECKMAN	764-1-R100k	–
C1	150002	10µF 20% 16 V DIP TANT.	UNION CARBIDE	K10E16	1
C2	150005	2µ2F 20% 16V DIP TANT.	UNION CARBIDE	K2R2E16	1
C3	150008	470nF 20% 35V DIP TANT.	UNION CARBIDE	KR47E35	1
C4	110005	10nF 20% 250v POLYESTER	MULLARD	C280 AE P10K	1
C5	150016	1µF 20% 35v DIP. TANT.	UNION CARBIDE	K1R0E35	5
C6	150016	1µF 20% 35v DIP. TANT.	UNION CARBIDE	K1R0E35	–
C7	150016	1µF 20% 35v DIP TANT.	UNION CARBIDE	K1R0E35	–
C8	150016	1µF 20% 35v DIP TANT.	UNION CARBIDE	K1R0E35	–
C9	150016	1µF 20% 35v DIP TANT.	UNION CARBIDE	K1R0E35	–

NOTES

SEE SHEET 2 FOR LATEST ISSUE

ISS	1	2	3	4
ECO	RELEASED	1078	1093	1137
DATE	1.2.80	22.2.80	26.3.80	28.7.80
CHKD	MD	A.J.	A.J	AP

DATE 1.2.80
DRAWN IL
CHECKED MD
APPROVED

datron ELECTRONICS LTD
TITLE 1061 BCD/PROG. PCB. ASSY
DRAWING NUMBER 400332
SHEET 2 OF 4

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
D1	200001	75mA 75V GP Si DIODE	FAIRCHILD	1N4148	1
M1	280081	PERIPHERAL INTERFACE ADAPTOR	MOTOROLA	MC68A21P, L	1
M2	290003	555 TIMER	FAIRCHILD	µA555TC	1
M3	270050	HEX INVERTOR LS	NATIONAL	DM74LS04N	2
M4	270048	QUAD 2 I/P NAND LS	NATIONAL	DM74LS00N	1
M5	270051	DUAL 4 I/P AND LS	NATIONAL	DM74LS21N	1
M6	270050	HEX INVERTOR LS	NATIONAL	DM74LS04N	–
M7	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	9
M8	280015	QUAD D-TYPE LATCH	MOTOROLA	MC 14076 BCP	–
M9	280015	QUAD D-TYPE LATCH	MOTOROLA	MC 14076 BCP	–
M10	280015	QUAD D-TYPE LATCH	MOTOROLA	MC 14076 BCP	–
M11	290080-9	2716 EPROM PROGRAMMED	DATRON	IB2716 (290080-ISS)	1
M12	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	–
M13	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	–
M14	280015	QUAD D-TYPE LATCH	MOTOROLA	MC 14076 BCP	–
M15	280015	QUAD D-TYPE LATCH	MOTOROLA	MC 14076 BCP	–
M16	280015	QUAD D-TYPE LATCH	MOTOROLA	MC 14076 BCP	–
M17	280024	TRI-STATE HEX BUFFER	MOTOROLA	MC14503 BCP	9
M18	280024	TRI-STATE HEX BUFFER	MOTOROLA	MC14503 BCP	–
M19	280024	TRI-STATE HEX BUFFER	MOTOROLA	MC14503 BCP	–
M20	280024	TRI-STATE HEX BUFFER	MOTOROLA	MC14503 BCP	–
M21	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	–

NOTES

SEE SHEET 2 FOR LATEST ISSUE

ISS		
ECO		
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CHKD		

DATE 1.2.80
DRAWN IL
CHECKED
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DATE

datron ELECTRONICS LTD
TITLE 1061 BCD/PROG. PCB ASSY
DRAWING NUMBER 400332
SHEET 3 OF 4

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
M22	280066	256 x 4 BIT STATIC CMOS RAM	SEE DRAWING		2
M23	280066	256 x 4 BIT STATIC CMOS RAM	SEE DRAWING		-
M24	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	-
M25	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	-
M26	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	-
M27	280024	TRI-STATE HEX. BUFFER	MOTOROLA	MC14503 BCP	-
TP's	540002	22 SWG BTC WIRE			A/R
J3	605051	4 WAY POLARISED SOCKET	MOLEX	(22-01-2045) 6471-4-1	1
J1	605064	24 WAY DIL. SOCKET	AUGAT	324-AG39D	4
J2	605064	24 WAY DIL. SOCKET	AUGAT	324-AG39D	-
	605037	14 WAY DIL. SOCKET	ASTRALUX OR JERMYN	ICL 143 S3T	4
	605038	16 WAY DIL. SOCKET	ASTRALUX OR JERMYN	ICL 163-S6T	18
J5	605064	24 WAY DIL. SOCKET	AUGAT	324-AG39D	-
	605050	40 WAY DIL. SOCKET	AUGAT	340-AG39D	1
	605059	8 WAY DIL. SOCKET	ASTRALUX	ICL-083-S6T	1
	605063	22 WAY DIL. SOCKET	AUGAT	322-AG39D	2
J4	605002	16 WAY DIL. SOCKET	ASTRALUX	ICN-163-S3G	1
	606005	SOCKET CLIP	ASTRALUX	RC-74	1
	617010	NYLATCH PLUNGER HN3P	ORDER FROM C.J.FOX + SONS	HN3P-32-4-1	6
	617011	NYLATCH GROMMET HN3G	ORDER FROM C.J. FOX + SONS	HN3G-32-1	6
	400379/1	WIRE/TERMINAL ASSY			3
	410100-4	PCB			1

NOTES

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TITLE 1061 BCD/ PROG. PCB. ASSY.

DRAWING NUMBER 400332

SHEET 4 OF 4

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1	000123	12K 5% ¼W CARBON	MULLARD	CR25	2
R2		NOT USED			–
R3	000332	3K3 5% ¼W CARBON	MULLARD	CR25	3
R4		NOT USED			–
R5	000123	12K 5% ¼W. CARBON	MULLARD	CR25	–
R6	000222	2K2 5% ¼W CARBON	MULLARD	CR25	1
R7		NOT USED			–
R8		NOT USED			–
R9		NOT USED			–
R10	000562	5K6 5% ¼W CARBON	MULLARD	CR25	1
R11	000183	18K 5% ¼W CARBON	MULLARD	CR25	1
R12	000105	1M 5% ¼W CARBON.	MULLARD	CR25	1
R13		NOT USED			–
R14	000103	10k 5% ¼W CARBON	MULLARD	CR25	2
R15		NOT USED			–
R16	000332	3K3 5% ¼W CARBON	MULLARD	CR25	–
R17		NOT USED			–
R18	000681	680R 5% ¼W CARBON	MULLARD	CR25	1
R19	000332	3K3 5% ¼W CARBON	MULLARD	CR25	–
R20	000103	10k 5% ¼W CARBON	MULLARD	CR25	–

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS	A	1	2 C	3	4	5	6	7
ECO		REL TO PROD	972/996	981	1054	1085	1167	1199
DATE	9 MAY 79	17 MAY 79	25 OCT 79	6 NOV 79	2 JAN 80	22.4.80	28.9.80	24.2.81
CHKD			MD	MD	MD	MD	MD	MD

DATE 9 MAY 79
DRAWN W.G.SMITH
CHECKED MD
APPROVED
DATE 17 MAY 79

datron ELECTRONICS LTD
TITLE REAR INPUT ASSY
1061/71
DRAWING NUMBER 400386
SHEET 3 OF 8.

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C1	150022	2µ2F. 20% 35V DIP TANT.	UNION CARBIDE	K2R2E35	1
C2		NOT USED			–
C3		NOT USED			–
C4	150007	6µ8F 20% 16V. DIP. TANT.	UNION CARBIDE	K6R8E16	1
C5	102101	100pF 10% 500V. CER. DISC	ITT	CD10	1
C6	110013	100nF 20% 250V POLYESTER	MULLARD	C280AEP100K	1

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS								
ECO								
DATE								
CHKD								

DATE 23.9.80
DRAWN
CHECKED
APPROVED
DATE

datron ELECTRONICS LTD
TITLE REAR INPUT ASSY
1061/107
DRAWING NUMBER 400386
SHEET 4 OF 8

JW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
D1	200001	75mA 75V GP Si DIODE	FAIRCHILD	IN4148	5
D2		NOT USED			–
D3	200001	75mA 75V GP Si DIODE	FAIRCHILD	IN4148	–
D4		NOT USED			–
D5	200001	75mA. 75v GP Si DIODE	FAIRCHILD	IN4148	–
D6	200001	75mA 75v GP Si DIODE	FAIRCHILD	IN4148	–
D7	200001	75mA 75v GP Si DIODE	FAIRCHILD	IN4148	–
Q1	240001	Si NPN TRANSISTOR	NATIONAL	BC184/TO18	2
Q2		NOT USED			–
Q3	250001	Si PNP TRANSISTOR	NATIONAL	BC214/TO18	1
Q4		NOT USED.			–
Q5		NOT USED			–
Q6	240001	Si NPN TRANSISTOR	NATIONAL	BC184/TO18	–
M1	280011	DUAL D FLIP-FLOP	MOTOROLA	MC14013 BCP	1
J1	604036	CON. PIN STRIP OF 10 HORIZ TYPE	AMP	163740-8	2
J2, J3	605052	8WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-8-1	2

NOTES

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ISS
ECO
DATE
CHKD

DATE 9 MAY 79
DRAWN W.G.SMITH.
CHECKED MOD
APPROVED
DATE 17 MAY 79

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TITLE REAR INPUT ASSY.
1061/71
DRAWING NUMBER 400386
SHEET 5 OF 8

J.W. 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
J4 & J6	604033	FLAT WAFER PIN (4 WAY GOLD)	MOLEX	22-27-2041/GOLD	3
J5	605051	4WAY POLARISED SOCKET	MOLEX	22-01-2045	1
	400379/4	WIRE/TERMINAL ASSY	HOLDEN CORDS		6
	400379/5	WIRE/TERMINAL ASSY	HOLDEN CORDS		4.
RL1 (1)	330003	RELAY 2P2W CROSSBAR	P&B	R10-E1-L2-Q5·8K(25207)	1
RL2 (11)	330001	RELAY 4P2W CROSSBAR	P&B	R10-E1-L4-Q2·5K	1
RL3 & RL4		NOT USED.			
	410106-5	COMPONENT P.C.B			1
	410132-4	RELAY P.C.B.			1
	450257-1	SOCKET PLATE			1
	450241-1	RELAY BRACKET			1
	540002	22SWG TINNED COPPER WIRE			A/R
	540008	7/·2 PTFE INS. WHITE WIRE			140mm

NOTES. (1) ALTERNATIVE RELAY 330015 (OMRON) — USE M2·3 FULL HEX NUT. 615014
(11) ALTERNATIVE RELAY 330016 (OMRON) (CHALLENGE IND. FASTENERS)
2 OFF.

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DATE 9 MAY 79
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DATE 17 MAY 79

datron ELECTRONICS LTD
TITLE REAR INPUT ASSY
1061/71
DRAWING NUMBER 400386
SHEET 6 OF 8

J.W. 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No USED Per Assy.
	590001	SLEEVE. MAX CABLE Ø 3.0MM	HELLERMAN ELECTRIC	H15×20MM BLK HELSYN	17
	590004	SLEEVE — PTFE	HELLERMAN ELECTRIC	FE10	30MM.
J1	604008	7 WAY PLUG PANEL MTG	PYE CONNECTORS	M7P	1
	605009	7 WAY SOCKET	PYE CONNECTORS	M7S	1
	605057	CRIMP TERMINAL	MOLEX	4809-GL	2
	606001	LOCKING HOOD	PYE CONNECTORS	MHN	1
	606002	NUT	PYE CONNECTORS	MN	1
	606003	WASHER	PYE CONNECTORS	MLW	1
	605060	14 WAY DIL SOCKET	ASTRALUX OR JERMYN	ICN-246-S4T OR A23-2023Y	1
	611004	SCREW M3×6MM STEEL POSI-PAN	G.K.N	ZINC PLATED	7
	611007	SCREW M3×6MM STEEL POSI-CSK	G.K.N	ZINC PLATED	7
	611016	SCREW M3×8MM STEEL POSI-PAN	G.K.N	ZINC PLATED	4.
	612020	STAND-OFF NYLON M3×19 TRANSIPILLAR.	W.K. ELECTRONICS.	TP1/6.5/19/M3/I/I	5

NOTES

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ISS	
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DATE	
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DATE 9 MAY 79	datron ELECTRONICS LTD
DRAWN W.G.SMITH	TITLE REAR INPUT ASSY 1061/71
CHECKED MJD	
APPROVED	
DATE 17 MAY 79	DRAWING NUMBER 400386 — SHEET 7 OF 8

IW 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy.
	613005	WASHER M3 INT SHAKEPROOF ST.	GKN DISTRIBUTORS	ZINC PLATED	13
	615001	NUT 8BA FULL HEX STEEL		ZINC PLATED	2
	615002	NUT M3 FULL HEX STEEL		ZINC PLATED	2
	700069	DPDT SLIDE SWITCH	WAYCOM	S-5022 CD03-0 + 3/4" TRIGGER & STYLE 2 C P.C.B MOUNT CONTACTS	1

NOTES

SEE SHEET 3 FOR LATEST ISSUE

ISS	
ECO	
DATE	
CHKD	

DATE 9 MAY 69	datron ELECTRONICS LTD
DRAWN W.G.SMITH	TITLE REAR INPUT ASSY. 1061/71
CHECKED MJD	
APPROVED	
DATE 17 MAY 79	DRAWING NUMBER 400386 — SHEET 8 OF 8

JW 1.64

DESIGNATOR		DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R1		090054	8k2 ·25% 10ppm MF	ACI	SEE DRG	1
R2		011181	1K18 1% ⅛W 50ppm MF	HOLCO	H8C	1
R3		015900	590R 1% ⅛W 50ppm MF	HOLCO	H8C	1
R4		012940	294R 1% ⅛W 50ppm MF	HOLCO	H8C	1
R5		011470	147R 1% ⅛W 50ppm MF	HOLCO	H8C	1
R6		090054	16k ·25% 10ppm MF	ACI	SEE DRG	—
R7	*	000434	430k 5% ¼W CARBON	MULLARD	CR25	1
R8		000394	390k 5% ¼W CARBON	MULLARD	CR25	1
R9		000103	10k 5% ¼W CARBON	MULLARD	CR25	5
R10		000155	1M5 5% ¼W CARBON	MULLARD	CR25	1
R11		000105	1M 5% ¼W CARBON	MULLARD	CR25	5
R12		000152	1k5 5% ¼W CARBON	MULLARD	CR25	1
R13		000224	220k 5% ¼W CARBON	MULLARD	CR25	1
R14		000333	33k 5% ¼W CARBON	MULLARD	CR25	3
R15		000104	100k 5% ¼W CARBON	MULLARD	CR25	7
R16		000685	6M8 5% ¼W CARBON	MULLARD	CR25	1
R17		000332	3k3 5% ¼W CARBON	MULLARD	CR25	5
R18		090053	100k ·25% 10ppm MF	ACI	SEE DRG	1
R19		090053	100k ·25% 10ppm MF	ACI	SEE DRG	—
R20			FSV (220k NOM)	MULLARD	CR25	1
R21		000821	820R 5% ¼W CARBON	MULLARD	CR25	1
R22		290026	RMS KIT	DATRON	SEE DRG	1
R23		000270	27R 5% ¼W CARBON	MULLARD	CR25	1

NOTES * NOT USED ON ASSEMBLIES FITTED INTO 1061's

SEE SHEET FOR LATEST ISSUE

ISS	11	12	13	14	15
ECO	1133	1160	1190	1201 . 1207	1217
DATE	13.6.80	29.9.80	5.1.81	6.4.81	19·8·81
CHKD	MD	MD	MD	MD	MD

DATE 17.8.79
DRAWN IL
CHECKED RJW
APPROVED

datron ELECTRONICS LTD
TITLE AC PCB ASSY
DRAWING NUMBER 400402
SHEET 2 OF 17

W 64

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R24	000107	100M 10% ¼W CARBON	ALLEN BRADLEY	CB10	4
R25	000331	330R 5% ¼W CARBON	MULLARD	CR25	2
R26	000154	150k 5% ¼W CARBON	MULLARD	CR25	1
R27	000334	330k 5% ¼W CARBON	MULLARD	CR25	1
R28	290026	RMS KIT	DATRON	SEE DRG	—
R29	000221	220R 5% ¼W CARBON	MULLARD	CR25	5
R30	000680	68R 5% ¼W CARBON	MULLARD	CR25	3
R31	000561	560R 5% ¼W CARBON	MULLARD	CR25	2
R32	000182	1k8 5% ¼W CARBON	MULLARD	CR25	2
R33	000333	33k 5% ¼W CARBON	MULLARD	CR25	—
R34	000103	10k 5% ¼W CARBON	MULLARD	CR25	—
R35	063500	50R POT ⅜"SQ. CERMET	BECKMAN	72P	2
R36	000125	1M2 5% ¼W CARBON	MULLARD	CR25	1
R37	000222	2k2 5% ¼W CARBON	MULLARD	CR25	5
R38	000124	120k 5% ¼W CARBON	MULLARD	CR25	2
R39	000104	100k 5% ¼W CARBON	MULLARD	CR25	—
R40	000103	10k 5% ¼W CARBON	MULLARD	CR25	—
R41	000332	3k3 5% ¼W CARBON	MULLARD	CR25	—
R42	000332	3k3 5% ¼W CARBON	MULLARD	CR25	—
R43	000332	3k3 5% ¼W CARBON	MULLARD	CR25	—
R44	000331	330R 5% ¼W CARBON	MULLARD	CR25	—
R45	000680	68R 5% ¼W CARBON	MULLARD	CR25	—
R46	000472	4k7 5% ¼W CARBON	MULLARD	CR25	1

NOTES

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DATE 17.8.79
DRAWN IL
CHECKED RJW
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DATE

datron ELECTRONICS LTD
TITLE AC PCB ASSY
DRAWING NUMBER 400402
SHEET 3 OF 17

J.W 1164

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
R47	090051	4k7 ·25% 10ppm MF	ACI	SEE DRG	1
R48	090053	8k975·25% 10ppm MF	ACI	SEE DRG	–
R49	000912	9k1 5% ¼W CARBON	MULLARD	CR25	1
R50	063500	50R POT ⅜"SQ. CERMET	BECKMAN	72P	–
R51	000107	100M 10% ¼W CARBON	ALLEN BRADLEY	CB10	–
R52	000122	1k2 5% ¼W CARBON	MULLARD	CR25	1
R53	000333	33k 5% ¼W CARBON	MULLARD	CR25	–
R54	000123	12k 5% ¼W CARBON	MULLARD	CR25	1
R55	000681	680R 5% ¼W CARBON	MULLARD	CR25	1
R56	000103	10k 5% ¼W CARBON	MULLARD	CR25	–
R57	000105	1M 5% ¼W CARBON	MULLARD	CR25	–
R58	000104	100k 5% ¼W CARBON	MULLARD	CR25	–
R59	000120	12R 5% ¼W CARBON	MULLARD	CR25	2
R60	000120	12R 5% ¼W CARBON	MULLARD	CR25	–
R61	000222	2k2 5% ¼W CARBON	MULLARD	CR25	–
R62	000332	3k3 5% ¼W CARBON	MULLARD	CR25	–
R63	000222	2k2 5% ¼W CARBON	MULLARD	CR25	–
R64	000222	2k2 5% ¼W CARBON	MULLARD	CR25	–
R65	000101	100R 5% ¼W CARBON	MULLARD	CR25	4
R66	000221	220R 5% ¼W CARBON	MULLARD	CR25	–
R67	000183	18k 5% ¼W CARBON	MULLARD	CR25	1
R68	090053	18k ·25% 10ppm MF	ACI	SEE DRG	–
R69	090051	4k7 ·25% 10ppm MF	ACI	SEE DRG	–

NOTES

SEE SHEET 2 FOR LATEST ISSUE

DATE 17.8.79
DRAWN IL
CHECKED RLW
APPROVED
DATE

datron ELECTRONICS LTD

TITLE AC PCB ASSY

DRAWING NUMBER 400402

SHEET 4 OF 17

DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
R70	000272	2K7 5% ¼W CARBON	MULLARD	CR25	2
R71	000272.	2K7 5% ¼W CARBON	MULLARD	CR25	–
R72	000330	33R 5% ¼W CARBON	MULLARD	CR25	1
R73	000105	1M 5% ¼W CARBON	MULLARD	CR25	–
R74	000824	820k 5% ¼W CARBON	MULLARD	CR25	1
R75	063504	500k POT ⅜"SQ CERMET	BECKMAN	72P	2
R76	090067	62k6 ·25% 10ppm MF	ACI	SEE DRG	1
R77	000104	100k 5% ¼W CARBON	MULLARD	CR25	–
R78	000225	2M2 5% ¼W CARBON	MULLARD	CR25	2
R79	000124	120k 5% ¼W CARBON	MULLARD	CR25	–
R80	000561	560R 5% ¼W CARBON	MULLARD	CR25	–
R81	000101	100R 5% ¼W CARBON	MULLARD	CR25	–
R82	000101	100R 5% ¼W CARBON	MULLARD	CR25	–
R83	000104	100k 5% ¼W CARBON	MULLARD	CR25	–
R84	000184	180k 5% ¼W CARBON	MULLARD	CR25	3
R85	000184	180k 5% ¼W CARBON	MULLARD	CR25	–
R86	000103	10k 5% ¼W CARBON	MULLARD	CR25	–
R87	000153	15k 5% ¼W CARBON	MULLARD	CR25	1
R88	000680	68R 5% ¼W CARBON	MULLARD	CR25	–
R89	000221	220R 5% ¼W CARBON	MULLARD	CR25	–
R90	063204	200k POT ⅜"SQ. CERMET	BECKMAN	72P	1
R91	000105	1M 5% ¼W CARBON	MULLARD	CR25	–
R92	000105	1M 5% ¼W CARBON	MULLARD	CR25	–

NOTES

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ISS
ECO
DATE
CHKD

DATE 17.8.79
DRAWN IL
CHECKED RLW
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DATE

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TITLE AC PCB ASSY

DRAWING NUMBER 400402

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R93	000225	2M2 5% ¼W CARBON	MULLARD	CR25	—
R94	000274	270k 5% ¼W CARBON	MULLARD	CR25	1
R95	090052	9k ·25% 10ppm MF	ACI	SEE DRG	1
R96	090052	1k ·25% 10ppm MF	ACI	SEE DRG	—
R97	000101	100R 5% ¼W CARBON	MULLARD	CR25	—
R98	000471	470R 5% ¼W CARBON	MULLARD	CR25	2
R99	000182	1k8 5% ¼W CARBON	MULLARD	CR25	—
R100	000184	180k 5% ¼W CARBON	MULLARD	CR25	—
R101	000221	220R 5% ¼W CARBON	MULLARD	CR25	—
R102	090067	62k6 ·25% 10ppm MF	ACI	SEE DRG	—
R103	000221	220R 5% ¼W CARBON	MULLARD	CR25	—
R104	000163	16k 5% ¼W CARBON	MULLARD	CR25	1
R105	000623	62k 5% ¼W CARBON	MULLARD	CR25	1
R106	011001	1k00 1% ⅛W 50ppm MF	HOLCO	H8C	3
R107	011803	180k 1% ⅛W 50ppm MF	HOLCO	H8C	1
R108	042215	22M1 1% ½W 100ppm MF	ALLEN BRADLEY	CC	2
R109	090066	1k ·25% 10ppm MF	ACI	SEE DRG.	1
R110	090066	10k1 ·25% 10ppm MF	ACI	SEE DRG	—
R111	090066	111k ·25% 10ppm MF	ACI	SEE DRG	—
R112	063504	500k POT ⅜"SQ CERMET	BECKMAN	72P	—
R113	042215	22M1 1% ½W 100ppm MF	ALLEN BRADLEY	CC	—
R114	090066	1M ·25% 10ppm MF	ACI	SEE DRG	—
R115	000822	8k2 5% ¼W CARBON	MULLARD	CR25	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
R116	000336	33M 10% ¼W CARBON	ALLEN BRADLEY	CB10	1
R117	000102	1k 5% ¼W CARBON	MULLARD	CR25	2
R118	000823	82k 5% ¼W CARBON	MULLARD	CR25	1
R119	000107	100M 10% ¼W CARBON	ALLEN BRADLEY	CB10	—
R120	000102	1k 5% ¼W CARBON	MULLARD	CR25	—
R121	063105	1M POT ⅜"SQ CERMET	BECKMAN	72 P	1
R122	000104	100k 5% ¼W CARBON	MULLARD	CR25	—
R123	090066	277k ·25% 10ppm MF	ACI	SEE DRG	—
R124	090066	277k ·25% 10ppm MF	ACI	SEE DRG	—
R125	090066	277k ·25% 10ppm MF	ACI	SEE DRG	—
R126	090066	277k ·25% 10ppm MF	ACI	SEE DRG	—
R127	000107	100M 10% ¼W CARBON	ALLEN BRADLEY	CB10	—
R128	000476	47M 10% ¼W CARBON	ALLEN BRADLEY	CB10	1
R129	000222	2k2 5% ¼W CARBON	MULLARD	CR25	—
R130	000471	470R 5% ¼W CARBON	MULLARD	CR25	—
R131					
R132					
R133	011001	1k00 1% ⅛W 50ppm M/F	HOLCO	H8C	—
R134	011001	1k00 1% ⅛W 50ppm M/F	HOLCO	H8C	—
R135	000104	100k 5% ¼W CARBON	MULLARD	CR25	—
R136	000273	27k 5% ¼W CARBON	MULLARD	CR25	1

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DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C1	120018	1μ5F 10% 63v POLYCARB	ASHCROFT	A2B1521B	1
C2	120030	820nF 10% 63v POLYCARB	ASHCROFT	SEE DRG.	1
C3	120021	470nF % 63v POLYCARB	ASHCROFT	A2B4711B	2
C4	120024	6μ8F 10% 63v POLYCARB	ASHCROFT	A2B6821B	1
C5	120020	220nF 10% 63v POLYCARB	ASHCROFT	A2B2211B	1
C6	150012	100nF 20% 35v DIP TANT	UNION CARBIDE	KR10E35	1
C7	120021	470nF 10% 63v POLYCARB	ASHCROFT	A2B4711B	—
C8	102680	68pF 5% 500v CER DISC	ITT	CD10	1
C9	102101	100pF 10% 500v CER DISC	ITT	CD10	2
C10	102471	470pF 10% 500v CER DISC	ITT	CD10	1
C11	150020	10μF 20% 25v DIP TANT	UNION CARBIDE	K10E25	8
C12	110013	100nF 20% 250v POLYESTER	MULLARD	C280AEP100k	5
C13	150020	10μF 20% 25v DIP TANT	UNION CARBIDE	K10E25	—
C14	150020	10μF 20% 25v DIP TANT	UNION CARBIDE	K10E25	—
C15	101103	10nF 25% 250v CER DISC	ITT	CD10	7
C16	150003	47μF 20% 6V3 DIP TANT	UNION CARBIDE	K47E6V3	1
C17	110013	100nF 20% 250v POLYESTER	MULLARD	C280AE P100k	—
C18	102108	1pF ±·5pF 500v CER DISC	ITT	CD06	1
C19	102470	47pF 5% 500v CER DISC	ITT	CD10	1
C20	150020	10μF 20% 25v DIP TANT	UNION CARBIDE	K10E25	—
C21	110013	100nF 20% 250v POLYESTER	MULLARD	C280AE P100k	—
C22	102100	10pF 5% 500v CER DISC	ITT	CD10	3
C23	102100	10pF 5% 500v CER DISC	ITT	CD10	—

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DESIGNATOR	DATRON PART No.	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C24	102478	4p7F ±·5pF 500v CER DISC	ITT	CD08	2
C25	102478	4p7F ±·5pF 500v CER DISC	ITT	CD08	—
C26	150020	10μF 20% 25v DIP TANT	UNION CARBIDE	K10E25	—
C27	150020	10μF 20% 25v DIP TANT	UNION CARBIDE	K10E25	—
C28	150016	1μF 20% 35v DIP TANT	UNION CARBIDE	K1R0E35	1
C29	130071	150pF 1% 160v POLYSTYRENE	SUFLEX	HSQ150/1 – 7/160	2
C30	130013	18pF ±1pF 160v POLYSTYRENE	SUFLEX	HS18/1 – 7/160	1
C31	110013	100nF 20% 250v POLYESTER	MULLARD	C280AEP100k	—
C32	110035	220nF 20% 63V POLYESTER	WIMA	MKS2MIN	2
C33	110035	220nF 20% 63v POLYESTER	WIMA	MKS2MIN	—
C34		NOT USED.			—
C35	120022	1n5F 20% 100v POLYCARB	WIMA	FKC2MIN	2
C36	120022	1n5F 20% 100v POLYCARB	WIMA	FKC2MIN	—
C37	102101	100pF 10% 500v CER DISC	ITT	CD10	—
C38	102100	10pF 5% 500v CER DISC	ITT	CD10	—
C39	102331	330pF 10% 500v CER DISC	ITT	CD10	1
C40	150020	10μF 20% 25V DIP TANT	UNION CARBIDE	K10E25	—
C41	101103	10nF 25% 250v CER DISC	ITT	CD10	—
C42	130072	9p1F ±·5pF 160v POLYSTYRENE	SUFLEX	HS 9·1/·5 – 7/160	1
C43	130071	150pF 1% 160v POLYSTYRENE	SUFLEX	HSQ150/1 – 7/160	—
C44	150023	33μF 20% 25v DIP TANT	UNION CARBIDE	K33E25	1
C45	102120	12pF 5% 500v CER DISC	ITT	CD10	1
C46	102688	6p8F ±·5pF 500v CER DISC	ITT	CD10	1

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C47	101103	10nF 25% 250v CER DISC	ITT	CD10	—
C48	140035	10nF 1% 125v SILV. MICA	ITT	454/274	1
C49	140034	1nF 1% 300v GLASS	ELECTROSIL	CYFM15	1
C50	110013	100nF 20% 250v POLYESTER	MULLARD	C280AE P100k	—
C51	140033	91pF 1% 500v GLASS	ELECTROSIL	CYFM10	1
C52	110026	6n8F 20% 100v POLYESTER	WIMA	FKS2 MIN	1
C53	101103	10nF 25% 250v CER DISC	ITT	CD10	—
C54	101103	10nF 25% 250v CER DISC	ITT	CD10	—
C55	140039	15pF 5% 500v GLASS	ELECTROSIL	CYFM10	3
C56	150020	10µF 20% 25v DIP TANT	UNION CARBIDE	K10E25	—
C57	120001	220nF 10% 1kV POLYCARB	SUFLEX	SN1380	1
C58	140031	13pF 5% 500v GLASS	ELECTROSIL	CYFM10	1
C59	140039	15pF 5% 500v GLASS	ELECTROSIL	CYFM10	—
C60	140039	15pF 5% 500v GLASS	ELECTROSIL	CYFM10	—
C61	140008	10pF 1kV TRIMMER	JACKSON	TETFER VPC	1
C62	140036	25pF 1kV TRIMMER	JACKSON	TETFER VPC 5646	2
C63	140036	25pF 1kV TRIMMER	JACKSON	TETFER VPC 5646	—
C64	102228	2p2F ±.5pF 500v CER DISC	ITT	CD08	1
C65		NOT USED			—
C66	102220	22pF 5% 500V CER DISC	ITT	CD10	2
C67	102220	22pF 5% 500v CER DISC	ITT	CD10	—
C68	101103	10nF 25% 250V CER DISC	ITT	CD10	—
C69	101103	10nF 25% 250V CER DISC	ITT	CD10	—

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
C70	102330	33pF 5% 500v CER DISC	ITT	CD10	2
C71	102330	33pF 5% 500v CER DISC	ITT	CD10	—
C72		NOT USED			—

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
D1	220010	Si HOT CARRIER DIODE	HP	HSCH1001/IN6263	3
D2	200008	200mA 125V LL Si DIODE	FAIRCHILD	IN458A	5
D3	200008	200mA 125V LL Si DIODE	FAIRCHILD	IN458A	–
D4	200008	200mA 125V LL Si DIODE	FAIRCHILD	IN458A	–
D5	210100	10v 400mW ZENER	MULLARD	BZY88C10	2
D6	200008	200mA 125V LL Si DIODE	FAIRCHILD	IN458A	–
D7	210100	10v 400mW ZENER	MULLARD	BZY88C10	–
D8	220010	Si HOT CARRIER DIODE	HP	HSCH1001/IN6263	–
D9	220010	Si HOT CARRIER DIODE	HP	HSCH1001/IN6263	
D10		NOT USED			–
D11	220021	QUAD 29pF VARICAP DIODE	THOMPSON-CSF	BB109G4	SET OF 4
D12	200008	200mA 125V LL Si DIODE	FAIRCHILD	IN458A	–
D13	200001	75mA 75V GP Si DIODE	FAIRCHILD	IN4148	2
D14	220020	FET DIODE 100pA IR	TELEDYNE	PAD100	3
D15	220020	FET DIODE 100pA IR	TELEDYNE	PAD100	–
D16	200001	75mA 75v GP Si DIODE	FAIRCHILD	IN4148	–
D17	220020	FET DIODE 100pA IR	TELEDYNE	PAD100	–

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy.
Q1	230002	N-CHAN JFET	TELEDYNE	U1994 JF	3
Q2	230002	N-CHAN JFET	TELEDYNE	U1994 JF	–
Q3	230027	N-CHAN JFET	TELEDYNE	U3114 JF	1
Q4	240013	Si NPN TRANSISTOR	NATIONAL	BC184C/TO18	4
Q5	240006	Si NPN TRANSISTOR	NATIONAL	2N3904/TO18	7
Q6	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	7
Q7	240013	Si NPN TRANSISTOR	NATIONAL	BC184C/TO18	–
Q8	250008	Si PNP TRANSISTOR	NATIONAL	BC214C/TO18	6
Q9	230001	N-CHAN CURRENT LIM	SILICONIX	E506	1
Q10	250008	Si PNP TRANSISTOR	NATIONAL	BC214C/TO18	–
Q11	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	–
Q12	240006	Si NPN TRANSISTOR	NATIONAL	2N3904/TO18	–
Q13	250008	Si PNP TRANSISTOR	NATIONAL	BC214C/TO18	–
Q14	240013	Si NPN TRANSISTOR	NATIONAL	BC184C/TO18	–
Q15	240006	Si NPN TRANSISTOR	NATIONAL	2N3904/TO18	–
Q16	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	–
Q17	240006	Si NPN TRANSISTOR	NATIONAL	2N3904/TO18	–
Q18	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	–
Q19	230035	N-CHAN JFET	TELEDYNE	U1897JF	1
Q20	250008	Si PNP TRANSISTOR	NATIONAL	BC214C/TO18	–
Q21	250008	Si PNP TRANSISTOR	NATIONAL	BC214C/TO18	–
Q22	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	–
Q23	250004	Si PNP TRANSISTOR	NATIONAL	2N3906/TO18	–

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No. USED Per Assy
Q24	240006	Si NPN TRANSISTOR	NATIONAL	2N3904 / TO18	–
Q25	250004	Si PNP TRANSISTOR	NATIONAL	2N3906 / TO18	–
Q26	240006	Si NPN TRANSISTOR	NATIONAL	2N3904 / TO18	–
Q27	250008	Si PNP TRANSISTOR	NATIONAL	BC214C / TO18	–
Q28	240013	Si NPN TRANSISTOR	NATIONAL	BC184C / TO18	–
Q29	240006	Si NPN TRANSISTOR	NATIONAL	2N3904 / TO18	–
Q30	230003	N-CHAN JFET	TELEDYNE	U1899 JF	1
Q31	230002	N-CHAN JFET	TELEDYNE	U1994 JF	–
Q32	230031	N-CHAN DUAL JFET	TELEDYNE	SU2656M	2
Q33	240019	Si NPN DUAL TRANSISTOR	PMI	MAT 01H	1
Q34	230031	N-CHAN DUAL JFET	TELEDYNE	SU2656M	–

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No USED Per Assy
M1	260027	714 OP AMP	FAIRCHILD	μA714HC	5
M2	260027	714 OP AMP	FAIRCHILD	μA714 HC	–
M3	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	2
M4	280015	QUAD D-TYPE LATCH	MOTOROLA	MC14076 BCP	–
M5	280011	DUAL D FLIP-FLOP	MOTOROLA	MC14013 BCP	1
M6	290026	RMS KIT	DATRON	SEE DRG	–
M7	270059	7x DARLINGTON DRIVER	SPRAGUE / EXAR	ULN 2004 A / XR 2204CP	1
M8	260027	714 OP AMP	FAIRCHILD	μA714 HC	–
M9	260027	714 OP AMP	FAIRCHILD	μA714 HC	–
M10	290066	FREQ. SENSITIVE SWITCH	CONSUMER MICROCIRCUITS	FX 301L	1
M11	260027	714 OP AMP	FAIRCHILD	μA714HC	–
RL1	330012	RELAY REED 1A GUARDED	HAMLIN	HE721A5134	4
RL2	(1) 330003	RELAY 2P2W CROSS BAR	P & B	R10-E1-L2-Q5-8K (25207)	2
RL3	(1) 330003	RELAY 2P2W CROSS BAR	P & B	R10-E1-L2-Q5-8K (25207)	–
RL4	330012	RELAY REED 1A GUARDED	HAMLIN	HE721A5134	–
RL5	330012	RELAY REED 1A GUARDED	HAMLIN	HE721A5134	–
RL6	330012	RELAY REED 1A GUARDED	HAMLIN	HE721A5134	–

NOTES (1) ALTERNATIVE RELAY 330015 (OMRON) — USE M2·3 FULL HEX NUT 615014 (CHALLENGE IND. FASTENERS). 2 OFF

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No.	No USED Per Assy
TP's, TL's.	540002	22 SWG. TINNED COPPER WIRE			A/R
	590004	SLEEVE — PTFE	HELLERMANN ELECTRIC	FE10	A/R
J1	571095\C	16 WAY AP/3M RIBBON CABLE	DATRON		1
J2	605052	8 WAY POLARISED SOCKET	MOLEX	(22-01-2085) 6471-8-1	1
	590055	SLEEVE Ø1·0 SIL. RUBBER	HELLERMANN ELECTRIC	HIS CONT. BLACK	50mm
	400379/1	WIRE/TERMINAL ASSY.			1
	410136-4	PCB			1
	450249-2	GUARD SHIELD			1
	459112-2	RELAY BRACKET			2
	605056	CRIMP TERMINAL	MOLEX	4809-TL	1
	540008	7/0·2 PTFE INSULATED (WHITE) WIRE			A/R
	590001	SLEEVE MAX. CABLE Ø3·0	HELLERMAN ELECTRIC	HIS×20mm BLACK HELSYN	7
	602001	FSV TERMINAL	MOLEX	02-04-1875	2
	602004	BREAKAWAY TERMINAL STRIP	MOLEX	05-30-0001	16
	605060	14 PIN DIL SOCKET	ASTRALUX	ICL 143-S3T	1
	605061	16 PIN DIL SOCKET	ASTRALUX	ICL 163-S6T	3
	605057	CRIMP TERMINAL	MOLEX	4809-GL	1
	611007	SCREW M3×6mm STEEL POZI-	CSK ZN/PLATED GKN		3
	611016	SCREW M3×8mm STEEL POZI-	PAN ZN/PLATED GKN		5

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DESIGNATOR	DATRON PART No	DESCRIPTION	PRINCIPAL MANUFACTURER	MANUFACTURER'S PART No	No. USED Per Assy
	612021	STANDOFF M3×16 HEX STEEL	HARWIN	R6077-M3	3
	613005	WASHER M3 INT./SHAKEPROOF	ST. GKN DISTRIBUTORS	ZINC PLATED	5
	613014	WASHER M2·5 INT/SHAKEPROOF	ST. GKN DISTRIBUTORS	ZINC PLATED	2
	615002	NUT M3 FULL HEX STEEL		ZINC PLATED	2
	615005	NUT 3-48 UNC FULL HEX.ST.		ZINC PLATED	2
	617010	NYLATCH PLUNGER HN3P	ORDER FROM C.J.FOX & SONS	HN3P-32-4-1	4
	617011	NYLATCH GROMMET HN3G	ORDER FROM C.J.FOX & SONS	HN3G-32-1	4
	620003	SOLDER PCB TERMINAL LUG	HARWIN	H 2105A	2
	620005	CLOVERLEAF PTFE TERMINAL	SEALECTRO	FTE 15 P20	15
	630107	BRASS STRIP ·375mm THK×15·5	RIGHTON	½ HARD	130mm

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	400382 SHT 2	OPTION FITTING ASSY DRG	DATRON		
	400306	IEEE 488 OPTION PCB ASSY	DATRON		1
	573140	RIBBON CABLE ASSY			1
	400363	SOCKET PCB ASSY	DATRON		1
	400346	ADDRESS SWITCH PCB ASSY	DATRON		1
	400400	EXTERNAL TRIGGER ASSY	DATRON		1
	450169-2	STUD MOUNT STAND OFF			2
	450225-1	IEEE ADAPTOR PLATE			1
	611006	SCREW M3×10 POSI PAN HD			2
	613005	WASHER M3 INTERNAL SH'KPROOF			2
	613020	WASHER M4 FLAT-STEEL			2
	613021	WASHER M4 INTERNAL SH'KPROOF			2
	615011	NUT M4 FULL HEX-STEEL			2
	630042	ADHESIVE CABLE CLIP	RICHCO	CFCC-8	2
M4	SEE TABLE	4K × 8 EPROM	DATRON	—	1

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TYPE	KIT	M4.
1061	440068	290070-8A
1071	440065	290069-7A

ISS	A	1	2	3	4	5	6	7	8	9
ECO	-	—	1005	1017	1022 1023 1058	1000	1057	1083	1086	1106
DATE	15 MAY 79	18 MAY 79	26-OCT 79	4-12-79	13-12-79	18.1.80	23.1.80	4.3.80	20.3.80	28.3.80
CHKD			MD	MD	MD	MD	MD	MD	MD	MP

DATE 15 MAY 79

DRAWN W.G. SMITH

CHECKED G.C.M.

APPROVED

DATE 18 MAY 79.

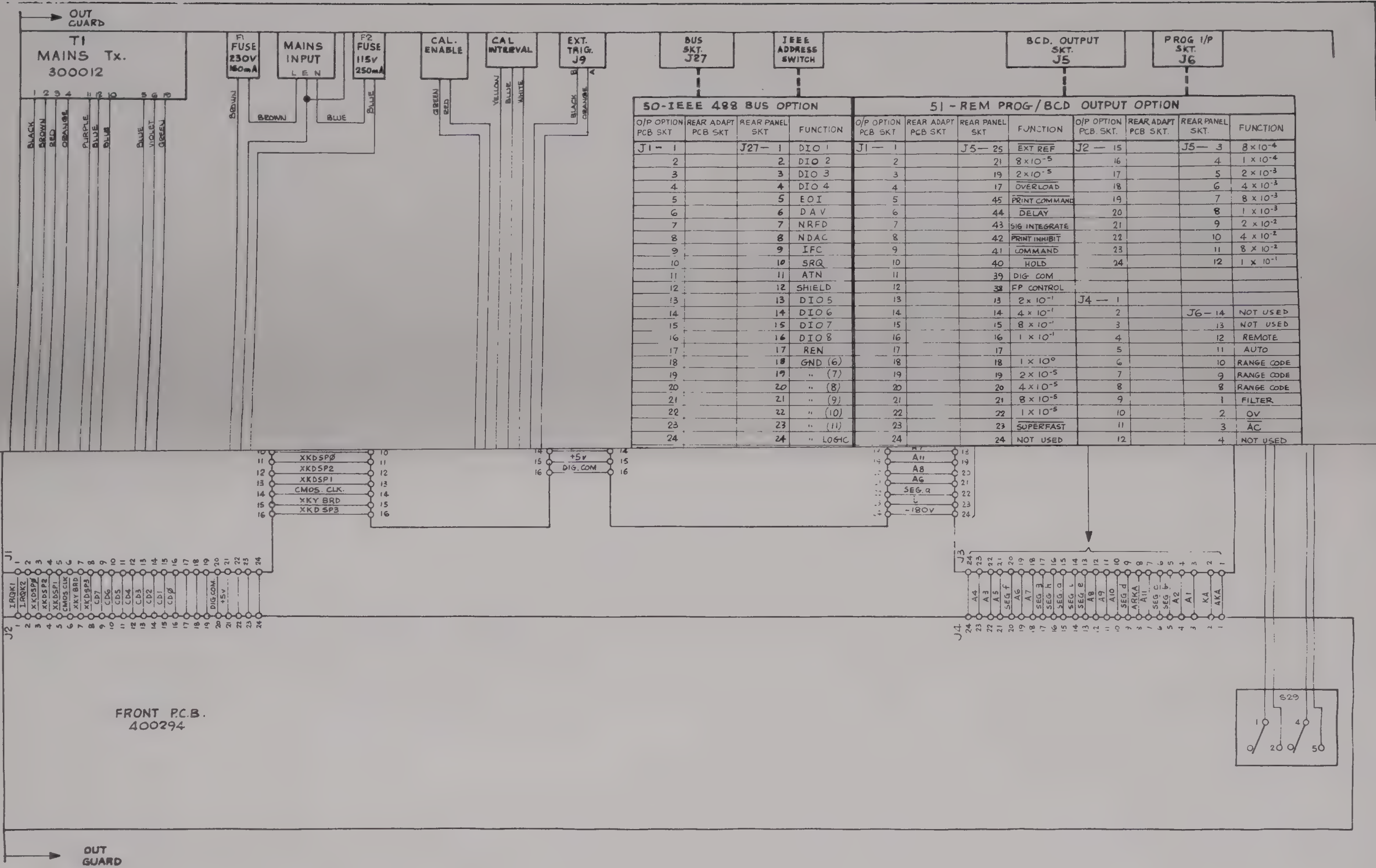
datron ELECTRONICS LTD

TITLE I.E.E.E. 488 OPTION
1071/1061

DRAWING NUMBER 440065/68

SHEET 1 OF 1

ISS	CHANGES
B	
1	RELEASED TO PRODN. 10.4.80


OUT GUARD
T1 MAINS Tx. 300012
1 2 3 4 11 12 10 5 6 8
BLACK
BROWN
RED
ORANGE
PURPLE
BLUE
BLUE
BLUE
VIOLET
GREEN
F1 FUSE 230V 160mA
BROWN
MAINS INPUT
L E N
BROWN
BLUE
F2 FUSE 115V 250mA
BLUE
CAL. ENABLE
GREEN
RED
CAL INTERVAL
YELLOW
BLUE
WHITE
EXT. TRIG. J9
B
A
BLACK
ORANGE
BUS SKT. J27
IEEE ADDRESS SWITCH
BCD. OUTPUT SKT. J5
PROG I/P SKT. J6
XKDSPØ
XKDSP2
XKDSP1
CMOS. CLK.
XKY BRD
XKD SP3
+5v
DIG. COM
A11
A8
A6
SEG. a
-180V
J1
J2
IRQK1
IRQK2
XKDSPØ
XKDSP2
XKDSP1
CMOS CLK
XKY BRD
XKDSP3
CD7
CD6
CD5
CD4
CD3
CD2
CD1
CDØ
DIG.COM.
+5V
J3
J4
A4
A3
A5
SEG f
A6
A7
SEG g
SEG h
SEG. a
SEG i
SEG e
A8
A9
A10
SEG d
ARKA
A11
SEG c
SEG b
A2
A1
KA
AKA
S29
1
2
4
5
FRONT P.C.B. 400294
OUT GUARD

50-IEEE 488 BUS OPTION			
O/P OPTION PCB SKT	REAR ADAPT PCB SKT	REAR PANEL SKT	FUNCTION
J1- 1		J27- 1	DIO 1
2		2	DIO 2
3		3	DIO 3
4		4	DIO 4
5		5	EOI
6		6	DAV
7		7	NRFD
8		8	NDAC
9		9	IFC
10		10	SRQ
11		11	ATN
12		12	SHIELD
13		13	DIO 5
14		14	DIO 6
15		15	DIO 7
16		16	DIO 8
17		17	REN
18		18	GND (6)
19		19	" (7)
20		20	" (8)
21		21	" (9)
22		22	" (10)
23		23	" (11)
24		24	" LOGIC

51 - REM PROG/BCD OUTPUT OPTION							
O/P OPTION PCB SKT	REAR ADAPT PCB SKT	REAR PANEL SKT	FUNCTION	O/P OPTION PCB. SKT.	REAR ADAPT PCB SKT.	REAR PANEL SKT.	FUNCTION
J1 — 1		J5— 25	$\overline{\text{EXT REF}}$	J2 — 15		J5— 3	8×10^{-4}
2		21	8×10^{-5}	16		4	1×10^{-4}
3		19	2×10^{-5}	17		5	2×10^{-3}
4		17	$\overline{\text{OVERLOAD}}$	18		6	4×10^{-3}
5		45	$\overline{\text{PRINT COMMAND}}$	19		7	8×10^{-3}
6		44	$\overline{\text{DELAY}}$	20		8	1×10^{-3}
7		43	SIG INTEGRATE	21		9	2×10^{-2}
8		42	$\overline{\text{PRINT INHIBIT}}$	22		10	4×10^{-2}
9		41	$\overline{\text{COMMAND}}$	23		11	8×10^{-2}
10		40	$\overline{\text{HOLD}}$	24		12	1×10^{-1}
11		39	DIG COM				
12		38	FP CONTROL				
13		13	2×10^{-1}	J4 — 1			
14		14	4×10^{-1}	2		J6— 14	NOT USED
15		15	8×10^{-1}	3		13	NOT USED
16		16	1×10^{-1}	4		12	REMOTE
17		17		5		11	AUTO
18		18	1×10^{0}	6		10	RANGE CODE
19		19	2×10^{-5}	7		9	RANGE CODE
20		20	4×10^{-5}	8		8	RANGE CODE
21		21	8×10^{-5}	9		1	FILTER
22		22	1×10^{-5}	10		2	OV
23		23	$\overline{\text{SUPERFAST}}$	11		3	$\overline{\text{AC}}$
24		24	NOT USED	12		4	NOT USED

DRAWN IL.
CHECKED MA
TRACED —
APPROVED
DATE 31. 1. 79
DATE
DIMENSIONS IN MILLIMETRES
SCALE
NOT TO BE SCALED

TOLERANCES ANGULAR ± °
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± .005
DECIMAL TO 2 PLACES ± .010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED

MATERIAL
FINISH

datron ELECTRONICS LTD. NORWICH.

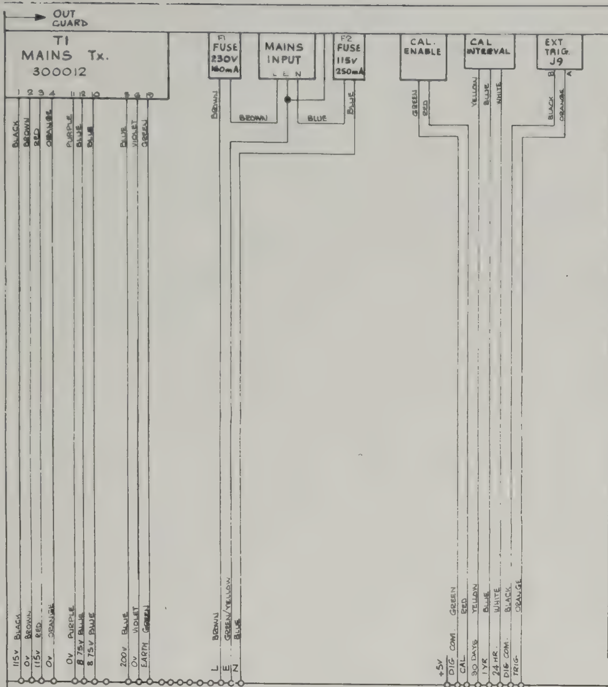
TITLE 1061 / 1071 INTERCONNECTION DIAGRAM.

DRAWING No.
430291
430326

DRAWING SIZE A1

SHEET 1 OF 2

ISS	CHANGES
B	
1	RELEASED TO PRODⁿ 10.4.80


OUT GUARD
T1 MAINS Tx. 300012
1 2 3 4 11 12 10 5 6 9
BLACK BROWN RED ORANGE PURPLE BLUE BLUE BLUE VIOLET GREEN
F1 FUSE 230V 160mA
MAINS INPUT L E N
F2 FUSE 115V 250mA
BROWN BLUE
CAL. ENABLE
GREEN RED
CAL INTERVAL
YELLOW BLUE WHITE
EXT TRIG. J9
B A
BLACK ORANGE
115V BLACK
0V BROWN
115V RED
0V ORANGE
0V PURPLE
8.75V BLUE
8.75V BLUE
200V BLUE
0V VIOLET
EARTH GREEN
BROWN
GREEN/YELLOW
BLUE
L E N
+5V
DIG COM GREEN
CAL RED
90 DAYS YELLOW
1YR BLUE
24 HR WHITE
DIG COM BLACK
TRIG ORANGE
J4 J5 J3 J7
REAR P.C.B. 400295

BUS SKT J27

IEEE ADDRESS SWITCH

BCD. OUTPUT SKT. J5

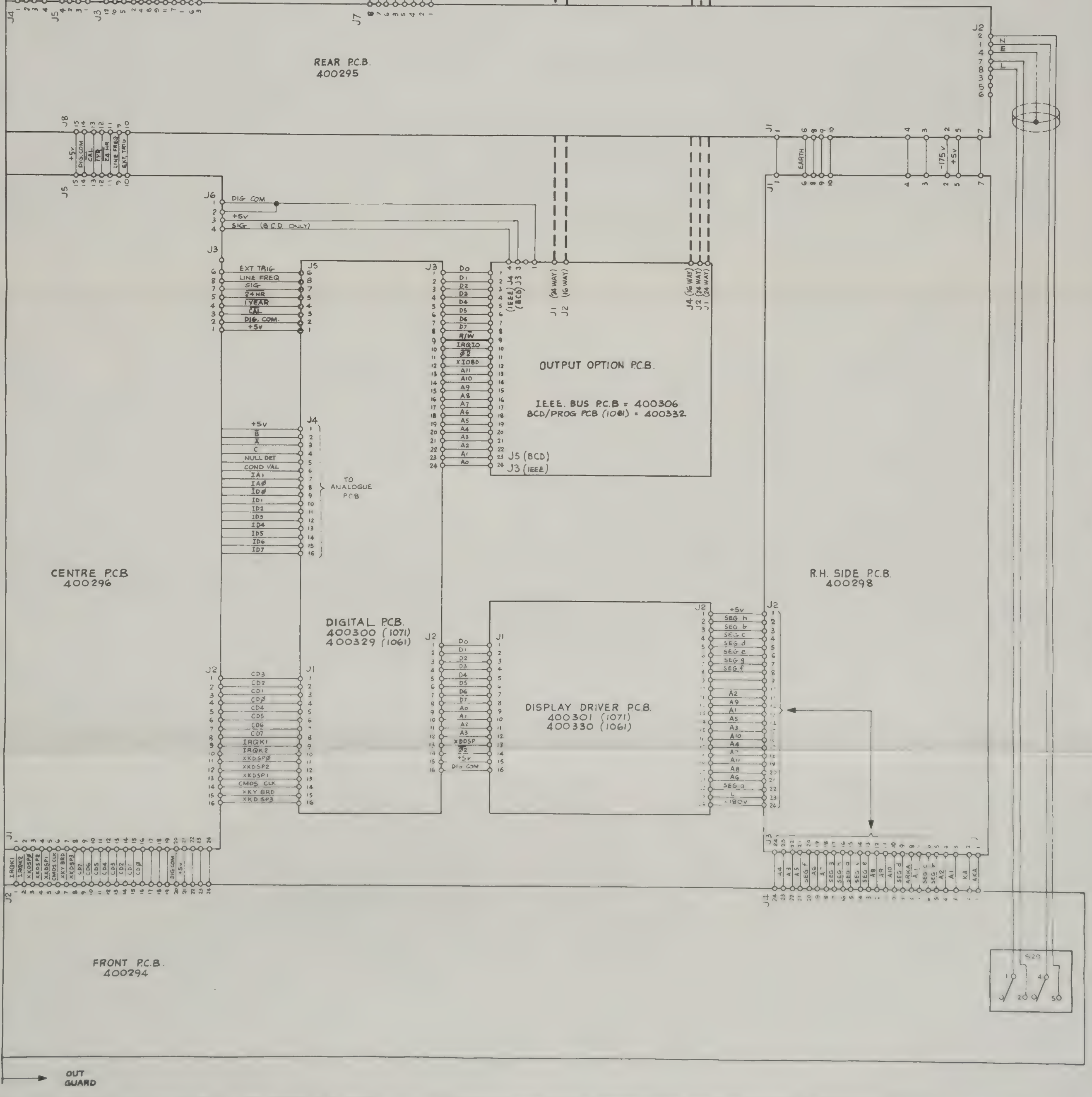
PROG I/P SKT J6

50-IEEE 488 BUS OPTION

O/P OPTION PCB SKT	REAR ADAPT PCB SKT	REAR PANEL SKT	FUNCTION
J1 — 1		J27 — 1	DIO 1
2		2	DIO 2
3		3	DIO 3
4		4	DIO 4
5		5	EOI
6		6	DAV
7		7	NRFD
8		8	NDAC
9		9	IFC
10		10	SRQ
11		11	ATN
12		12	SHIELD
13		13	D.IO.5
14		14	DIO 6
15		15	DIO 7
16		16	DIO 8
17		17	REN
18		18	GND (6)
19		19	" (7)
20		20	" (8)
21		21	" (9)
22		22	" (10)
23		23	" (11)
24		24	" LOGIC
J2 — 1			T.O
2			A5
3			A4
4			+5V
5			+5V
6			A3
7			A2
8			A1
9			A1
10			A2
11			A3
12			+5V
13			+5V
14			A4
15			A5
16			T.O.

51 - REM PROG/BCD OUTPUT OPTION

O/P OPTION PCB SKT	REAR ADAPT PCB SKT	REAR PANEL SKT	FUNCTION	O/P OPTION PCB SKT	REAR ADAPT PCB SKT	REAR PANEL SKT	FUNCTION
J1 — 1		J5 — 25	$\overline{\text{EXT REF}}$	J2 — 15		J5 — 3	8×10^{-4}
2		21	8×10^{-5}	16		4	1×10^{-4}
3		19	2×10^{-5}	17		5	2×10^{-3}
4		17	$\overline{\text{OVERLOAD}}$	18		6	4×10^{-3}
5		45	$\overline{\text{PRINT COMMAND}}$	19		7	8×10^{-3}
6		44	$\overline{\text{DELAY}}$	20		8	1×10^{-3}
7		43	SIG INTEGRATE	21		9	2×10^{-2}
8		42	$\overline{\text{PRINT INHIBIT}}$	22		10	4×10^{-2}
9		41	$\overline{\text{COMMAND}}$	23		11	8×10^{-2}
10		40	$\overline{\text{HOLD}}$	24		12	1×10^{-1}
11		39	DIG COM				
12		38	FP CONTROL				
13		13	2×10^{-1}	J4 — 1			
14		14	4×10^{-1}	2		J6 — 14	NOT USED
15		15	8×10^{-1}	3		13	NOT USED
16		16	1×10^{-1}	4		12	REMOTE
17		17		5		11	AUTO
18		18	1×10^{0}	6		10	RANGE CODE
19		19	2×10^{-5}	7		9	RANGE CODE
20		20	4×10^{-5}	8		8	RANGE CODE
21		21	8×10^{-5}	9		1	FILTER
22		22	1×10^{-5}	10		2	OV
23		23	$\overline{\text{SUPERFAST}}$	11		3	$\overline{\text{AC}}$
24		24	NOT USED	12		4	NOT USED
				13		5	$\overline{\Omega}$
				14		6	NOT USED
J2 — 1		5	2×10^{-3}	15		7	$\overline{\text{RATIO}}$
2		36	RANGE C	16			
3		35	RANGE B				
4		34	RANGE A				
5		33	$\overline{\text{AUTO}}$				
6		32	$\overline{\text{mV}}$				
7		31	$\overline{\text{FILTER}}$				
8		30	$\overline{\text{AC}}$				
9		29	$\overline{\text{DC}}$				
10		28	$\overline{\text{OHMS}}$				
11		27	$\overline{\text{PLUS POLARITY}}$				
12		26	$\overline{\text{MINUS POLARITY}}$				
13		1	2×10^{-4}				
14		2	4×10^{-4}				


J2 N E L
J1 EARTH -175V +5V
J8 J5 +5V DIG COM CAL 1YR 24 HR LINE FREQ EXT TRIG
J6 DIG COM +5V SIG (BCD ONLY)
J3 EXT TRIG LINE FREQ SIG 24HR 1YEAR CAL DIG. COM. +5V
J5
J4 +5V B A C NULL DET COND VAL IA1 IAØ IDØ ID1 ID2 ID3 ID4 ID5 ID6 ID7
TO ANALOGUE PCB
J3 D0 D1 D2 D3 D4 D5 D6 D7 R/W IRQIO Ø2 XIOBD A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
(IEEE) J4 (BCD) J3
J1 (24 WAY) J2 (16 WAY)
J4 (16 WAY) J2 (24 WAY) J1 (24 WAY)
OUTPUT OPTION P.C.B.
I.E.E.E. BUS P.C.B = 400306
BCD/PROG PCB (1061) = 400332
J5 (BCD)
J3 (IEEE)
CENTRE P.C.B 400296
DIGITAL P.C.B. 400300 (1071) 400329 (1061)
J2 J1 CD3 CD2 CD1 CDØ CD4 CD5 CD6 CD7 IRQK1 IRQK2 XKDSPØ XKDSP2 XKDSP1 CMOS CLK XKY BRD XKDSP3
J2 J1 D0 D1 D2 D3 D4 D5 D6 D7 A0 A1 A2 A3 XDDSP Ø2 +5V DIG COM
DISPLAY DRIVER P.C.B. 400301 (1071) 400330 (1061)
J2 +5V SEG h SEG b SEG c SEG d SEG e SEG g SEG f A2 A9 A1 A5 A3 A10 A4 A7 A11 A8 A6 SEG a -180V
R.H. SIDE P.C.B. 400298
J3 J1 A4 A3 A5 SEG f A6 A7 SEG 3 SEG h SEG e SEG g SEG d A10 A9 A8 ARKA SEG c SEG b A2 A1 KA KKA
J1 J2 IRQK1 IRQK2 XKDSPØ XKDSP2 XKDSP1 CMOS CLK XKY BRD XKDSP3 CD7 CD6 CD5 CD4 CD3 CD2 CD1 CDØ DIG COM +5V
FRONT P.C.B. 400294
S29 1 2 4 5
OUT GUARD

DRAWN IL	CHECKED MA	DIMENSIONS IN MILLIMETRE	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED ANGULAR ± °	MATERIAL
TRACED	APPROVED	SCALE		FINISH
DATE 31.1.79	DATE	NOT TO BE SCALED		

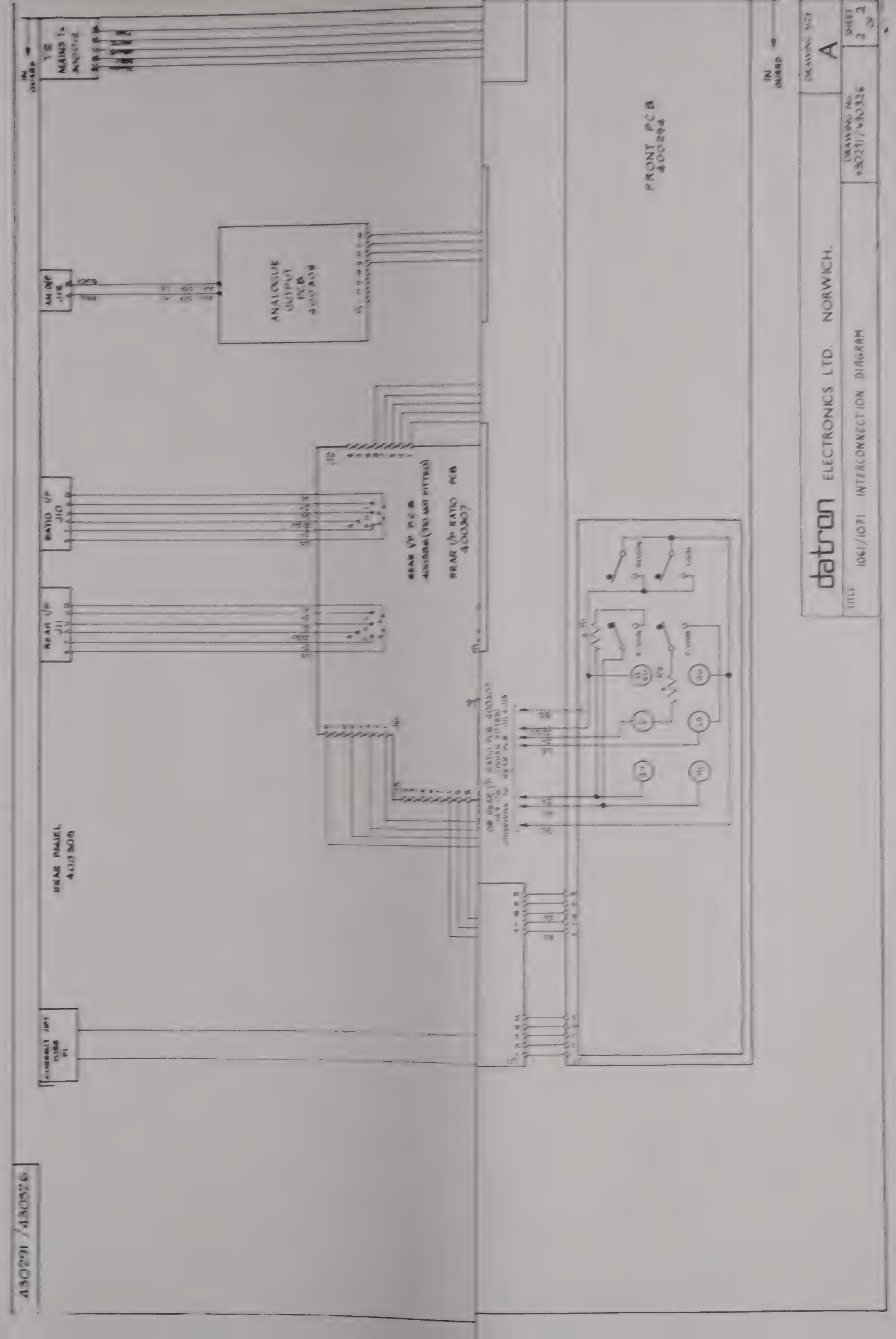
datron ELECTRONICS LTD. NORWICH.

TITLE 1061 / 1071 INTERCONNECTION DIAGRAM

DRAWING No 430291 430326

DRAWING SIZE A1

SHEET 1 OF 2


IN GUARD
MAINS I/P
AN O/P
J18
ANALOGUE OUTPUT PCB
RATIO I/P
J10
REAR I/P
J11
J8
REAR I/P PCB
(1061 NOT FITTED)
REAR I/P RATIO PCB
400307
REAR PANEL
400300
FRONT PCB
400294
HI
LO
R1
R2
4 WIRE
4 WIRE
REMOTE
LOCAL
P1
IN GUARD
430291 / 430326

datron ELECTRONICS LTD. NORWICH.

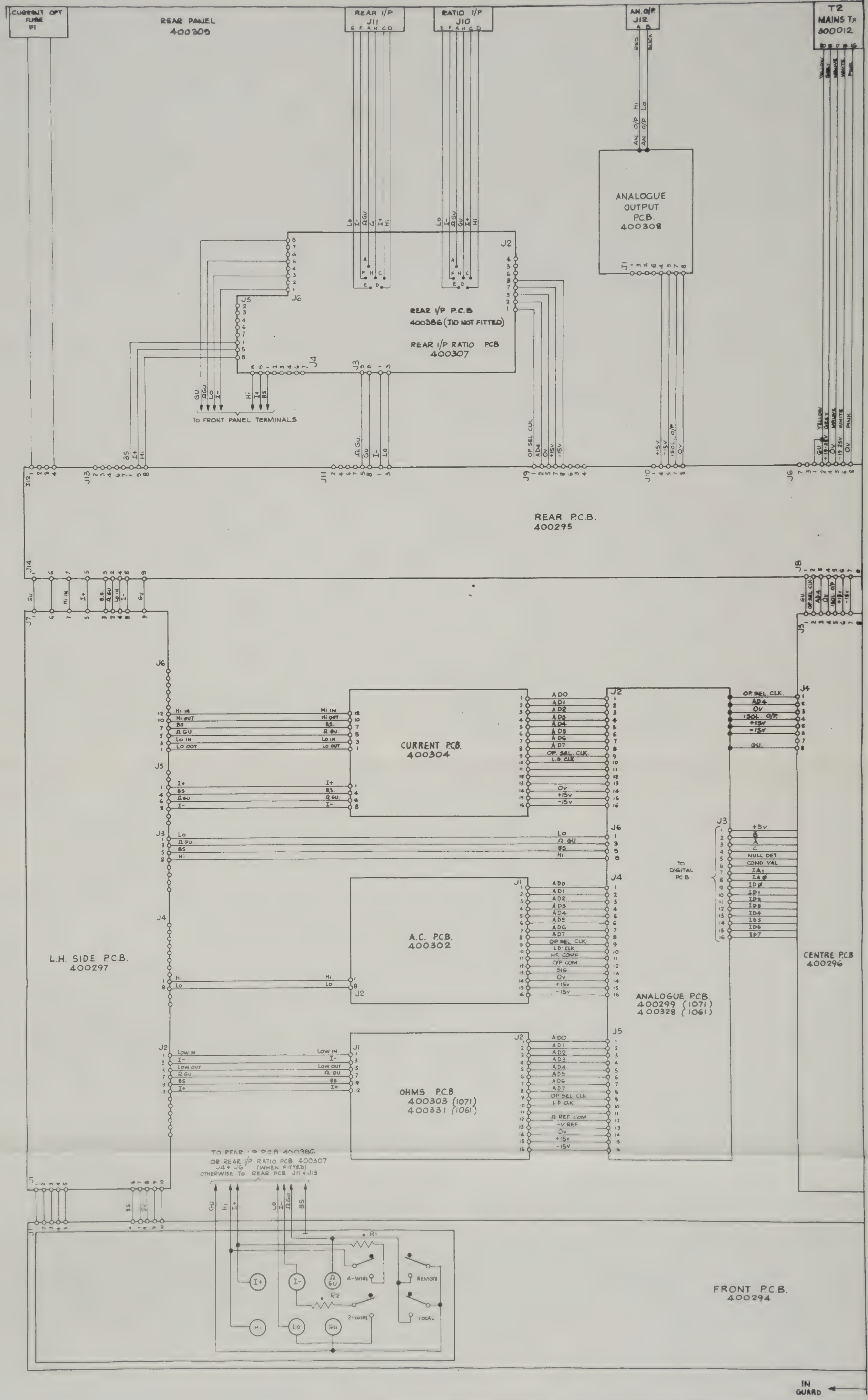
DRAWING SIZE A

TITLE 1061/1071 INTERCONNECTION DIAGRAM

DRAWING No. 430291/430326

SHEET 2 OF 2

430291 /430326.


CURRENT OPT FUSE F1
REAR PANEL 400309
REAR I/P J11
RATIO I/P J10
AN. O/P J12
T2 MAINS Tx 300012
ANALOGUE OUTPUT P.C.B. 400308
REAR I/P P.C.B 400386 (J10 NOT FITTED)
REAR I/P RATIO PCB 400307
TO FRONT PANEL TERMINALS
REAR P.C.B. 400295
CURRENT P.C.B. 400304
A.C. P.C.B. 400302
OHMS P.C.B. 400303 (1071) 400331 (1061)
ANALOGUE P.C.B. 400299 (1071) 400328 (1061)
TO DIGITAL PCB
CENTRE P.CB 400296
L.H. SIDE P.C.B. 400297
FRONT P.C.B. 400294
TO REAR I/P PCB 400386 OR REAR I/P RATIO PCB 400307 J4 + J6 (WHEN FITTED) OTHERWISE TO REAR PCB J11 + J13
IN GUARD
4-WIRE
2-WIRE
REMOTE
LOCAL
R1
R2
YELLOW
GREY
MAUVE
WHITE
PINK
OP SEL CLK
AD4
0V
ISOL. O/P
+15V
-15V
GU
Hi
Lo
I+
I-
BS
Ω GU
Hi IN
Hi OUT
Lo IN
Lo OUT
LOW IN
LOW OUT
AD0
AD1
AD2
AD3
AD5
AD6
AD7
L.D. CLK
HF. COMP
O/P COM
SIG
Ω REF COM
-V REF
NULL DET
COND VAL
IA1
IA0
ID0
ID1
ID3
ID4
ID5
ID6
ID7
+5V
J1
J2
J3
J4
J5
J6
J7
J8
J9
J10
J11
J12
J13
J14

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE A

TITLE 1061/1071 INTERCONNECTION DIAGRAM

DRAWING No. 430291/430326

SHEET 2 OF 2

400294

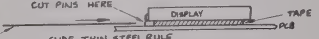
THIRD ANGL

DRAWN IN ACCORDANCE W

NOTES

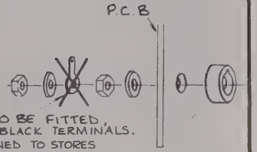
IMPORTANT.

1. FIT M1 3 4 5 6 8 9 11 12 & 13 INTO 16 WAY AUGAT SOCKET PART NO 605061
   FIT M7 & M10 INTO AUGAT SOCKET PART NO. 605062. 18 WAY
   FIT M2 INTO AUGAT SOCKET PART No. 605060. 14 WAY
2. TO REMOVE DISPLAY:-


CUT PINS HERE
DISPLAY
TAPE
PCB

SLIDE THIN STEEL RULE BETWEEN DISPLAY & PCB TO SPLIT FOAM TAPE

C		
D	UPDATED PCB REMOVED S29	
1	RELEASED TO PRODN 29-9-78	
2	SKETCH FOR HOLTITE SOCKETS ADDED BJ ECO 778 5 12 78	
3	ECO 816 WARNING LABEL (420080-1) ADDED ECO 818 C3 & C6 WERE 0.33uF (150010) 25 JAN 79 W.G.S	
4	ECO 867 LK3 ADDED BJ 11 JUN 79	MD
5	ECO 988 26-10-79 UPDATED PCB BJ. + 2 PIECES OF 630025 DELETED SOCKETS 602011 & 602012 DISPLAY REMOVAL NOTE	MD
6	ECO 1111 C9 ADDED IL 21 4 80	MD
7	ECO 1213 LK3 DELETED JR 11 6 81	MD



SOLDER TAG NOT TO BE FITTED, EXCEPT ON YELLOW & BLACK TERMINALS. THE REST TO BE RETURNED TO STORES UNDER PART No 613009

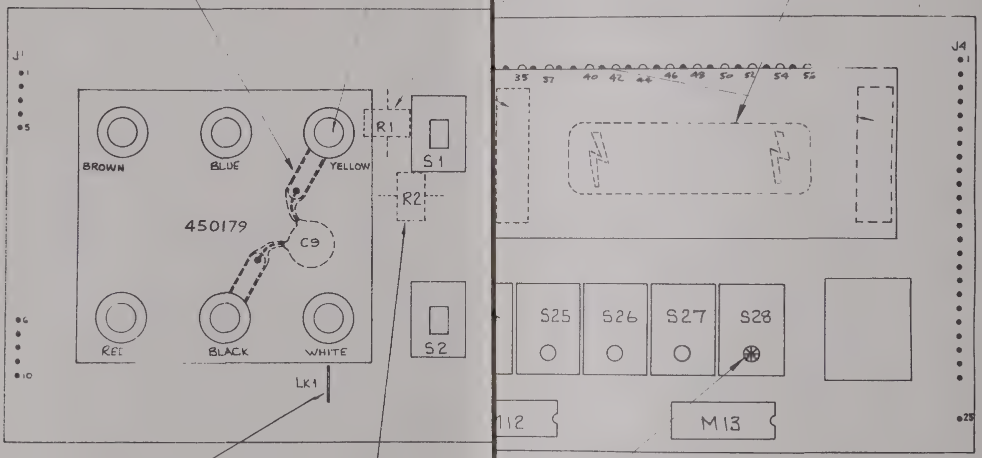
ASSEM
AND
MUST

SLEEVE LEADS OF C9 WITH HEATSHRINK Ø4.8 590032 & SOLDER TO TAGS ON **YELLOW** & **BLACK** TERMINALS

F PRESSURE
TO
N.
PLACE

FIT WARNING LABEL 420080-1 IN APPROX POSITION SHOWN ON TRACK SIDE OF P.C.B NEAR MAINS AND DISPLAY CONNECTIONS

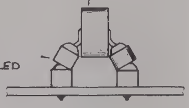
FRONT P.C.B. 410090-4C

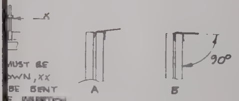

J1
1
5
6
10
BROWN
BLUE
YELLOW
450179
C9
RED
BLACK
WHITE
R1
R2
S1
S2
LK1
35
37
40
42
44
46
48
50
52
54
56
S25
S26
S27
S28
M12
M13
J4
1
25

ALL LINKS USE 22SWG TIN CU WIRE PART No 540002

GREEN L.E.D.s 2 OFF
ALL OTHERS RED.

RESISTORS R1 & R2
2 OFF INSULATING BEADS (PART No 630024) ASSEMBLED ON EACH LEG (AS SHOWN)





MUST BE
WN, XX
BE BENT
E INSERTION

CS LTD NORWICH

DRAWING SIZE A1

SSY 1061 / 1071

DRAWING N 400294

SHEET 1 OF 6

1

2

DRAWING No
430294

FIRST USED ON
1061/71

THIRD ANGLE P

DRAWN IN ACCORDANCE WITH BS

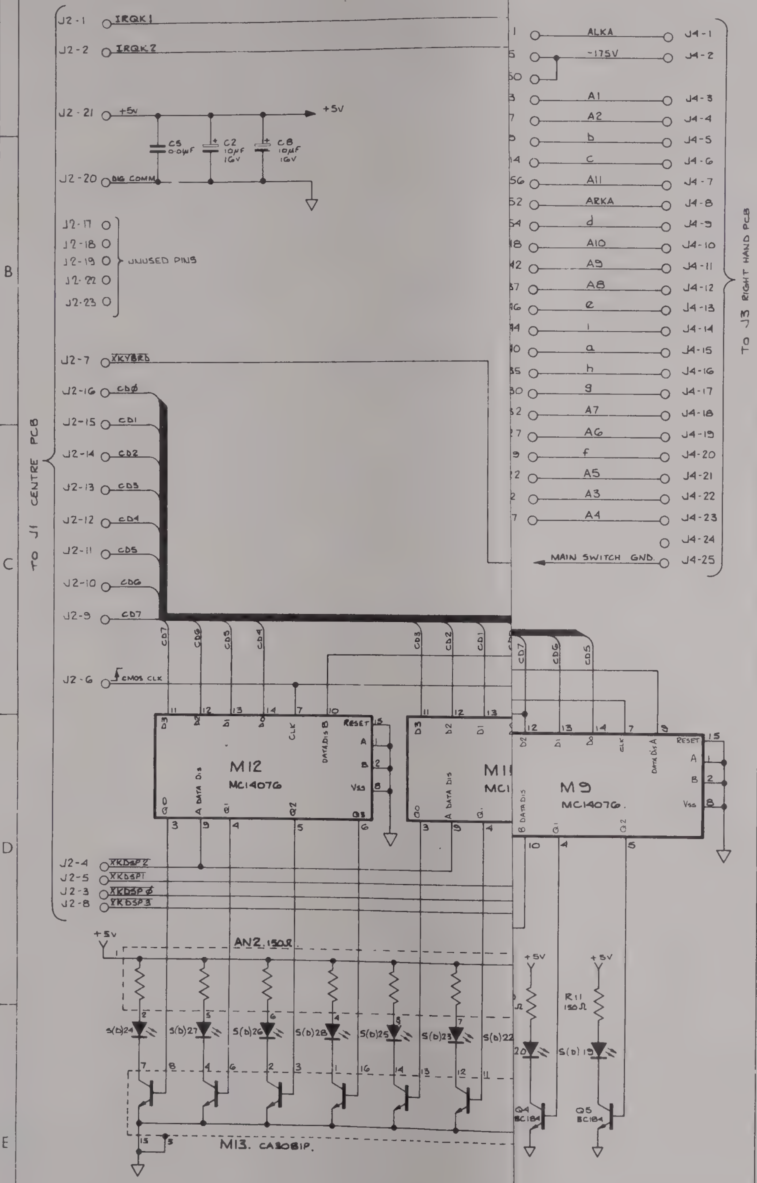
NOTES

CDI ON J2-15 THERE IS A LINK LK2
IS SIGNAL LINE

ISS	CHANGES
2	REDRAWN BJ 21-3-79
3	ECO ~~839~~ 869 CHANGE ON SHT2 BJ. 11-6-79
4	ECO 1111 SEE SHEET 2 IL 21 4.80

MD

MD



J2-1 IRQK1
J2-2 IRQK2
J2-21 +5V
+5V
C5 0.01μF
C2 10μF 16V
C8 10μF 16V
J2-20 DIG COMM
J2-17
J2-18
J2-19
J2-22
J2-23
UNUSED PINS
J2-7 XKYBRD
J2-16 CD0
J2-15 CD1
J2-14 CD2
J2-13 CD3
J2-12 CD4
J2-11 CD5
J2-10 CD6
J2-9 CD7
TO J1 CENTRE PCB
J2-6 CMOS CLK
M12
MC14076
M11
MC1
M9
MC14076.
DATA DIS A
DATA DIS B
RESET
CLK
Vss
J2-4 XKDSP2
J2-5 XKDSP1
J2-3 XKDSP0
J2-8 XKDSP3
+5V
AN2. 150Ω
S(D)24
S(D)27
S(D)26
S(D)28
S(D)25
S(D)23
S(D)22
20
S(D)19
R11 150Ω
Q4 BC184
Q5 BC184
M13. CA3081P.
ALKA J4-1
-175V J4-2
A1 J4-3
A2 J4-4
b J4-5
c J4-6
A11 J4-7
ARKA J4-8
d J4-9
A10 J4-10
A9 J4-11
A8 J4-12
e J4-13
i J4-14
a J4-15
h J4-16
g J4-17
A7 J4-18
A6 J4-19
f J4-20
A5 J4-21
A3 J4-22
A4 J4-23
J4-24
MAIN SWITCH GND. J4-25
TO J3 RIGHT HAND PCB
A
B
C
D
E

NORWICH.

DRAWING SIZE
A1

DRAWING No
430294

SHEET
1 OF 2

400294

THIRD ANGLE PROJECTION

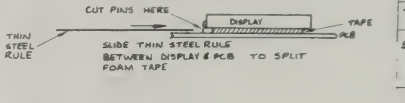
DRAWN IN ACCORDANCE WITH BS 308

LL BURRS TO BE REMOVED

NOTES

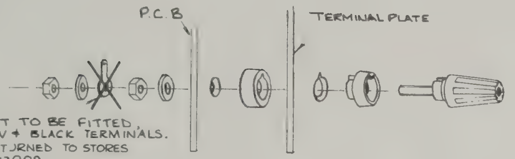
IMPORTANT.

1. FIT M1 3 4 5 6 8 9 11 12 & 13 INTO 16 WAY AUGAT SOCKET PART NO 605061
   FIT M7 & M10 INTO AUGAT SOCKET PART NO. 605062. 18 WAY
   FIT M2 INTO AUGAT SOCKET PART No. 605060. 14 WAY
2. TO REMOVE DISPLAY:-


CUT PINS HERE
DISPLAY
TAPE
PCB
THIN STEEL RULE

SLIDE THIN STEEL RULE BETWEEN DISPLAY & PCB TO SPLIT FOAM TAPE

D	UPDATED PCB REMOVED S29
1	RELEASED TO PRODN 29-9-78
2	SKETCH FOR HOLTITE SOCKETS ADDED BJ ECO 778 5 12 78
3	ECO 816 WARNING LABEL (420080-1) ADDED ECO 818 C3 & C6 WERE 0.33uF (150010) 25 JAN 79 W.G.S
4	ECO 867 LK3 ADDED BJ 11 JUN 79
5	ECO 988 26-10-79 UPDATED PCB BJ + 2 PIECES OF 630029 DELETED SOCKETS 602011 & 602012 DISPLAY REMOVAL NOTE
6	ECO 1111 C9 ADDED 21 4 80
7	ECO 1213 LK3 DELETED JR 11 6 81

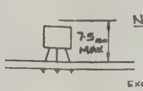

P.C.B
TERMINAL PLATE

SOLDER TAG NOT TO BE FITTED, EXCEPT ON YELLOW & BLACK TERMINALS. THE REST TO BE RETURNED TO STORES UNDER PART Nº 613009

ASSEMBLE 6 TERMINALS TO TERMINAL PLATE (PART Nº 450179) AND P.C.B AS SHOWN ABOVE. TERMINAL COLOURS MUST BE AS INDICATED BELOW

SLEEVE LEADS OF C9 WITH HEATSHRINK Ø4 8 590032 & SOLDER TO TAGS ON YELLOW & BLACK TERMINALS

RESISTORS R1 & R2 (SHOWN BY DOTTED LINES) TO BE MOUNTED ON UNDERSIDE OF BOARD.



NOTE.

NO COMPONENTS TO STAND HIGHER THAN 7.5 mm (EXCEPT SWITCH'S & TERMINALS)

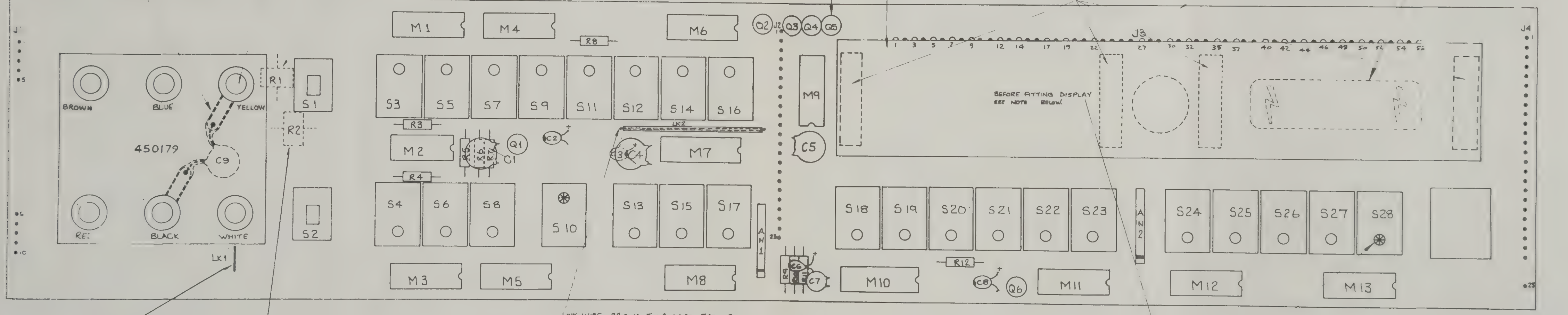
EXCEPT Q4 & Q5 WHICH MUST BE LESS THAN 6.5mm

8½ DIGIT DISPLAY (DATRON PART No 800017)

DISPLAY TO HAVE 4 PIECES (25mm LONG) OF PRESSURE SENSITIVE TAPE PART No 630029 STUCK TO REVERSE OF DISPLAY IN POSITIONS SHOWN. LINE UP & PRESS DISPLAY FIRMLY INTO PLACE THEN SOLDER THE 24 PINS ONLY WHICH ARE SHOWN BELOW. (THERE ARE SOLDER PADS FOR THESE PINS ONLY)

FIT WARNING LABEL 420080-1 IN APPROX POSITION SHOWN ON TRACK SIDE OF P.C.B NEAR MAINS AND DISPLAY CONNECTIONS

FRONT P.C.B. 410090-4C


M1
M4
R8
M6
Q2
J2
Q3
Q4
Q5
J3
1 3 5 7 9 12 14 17 19 22 27 30 32 35 37 40 42 44 46 48 50 52 54 56
J4
BROWN
BLUE
YELLOW
R1
S1
R2
450179
C9
RED
BLACK
WHITE
S2
LK1
S3
S5
S7
S9
S11
S12
S14
S16
M9
C5
R3
M2
R5
R6
R7
Q1
C1
C2
LK2
Q3
C4
M7
R4
S4
S6
S8
S10
S13
S15
S17
AN1
BEFORE FITTING DISPLAY SEE NOTE BELOW.
S18
S19
S20
S21
S22
S23
AN2
S24
S25
S26
S27
S28
M3
M5
M8
R9
C6
C7
M10
R12
C8
Q6
M11
M12
M13

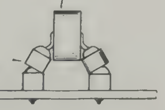
ALL LINKS USE 22SWG TIN CU WIRE PART No 540002

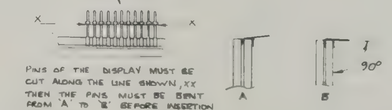
LINK WIRE 22 SWG TIN CU WIRE 540002. SLEEVE WITH 590004.

ALL CAPACITORS TO BE LAID DOWN WHERE POSSIBLE, AS SHOWN. LEADS TO BE BENT AT RIGHT ANGLES THEN INSERTED INTO BOARD, THIS IS TO KEEP CAPACITORS AS LOW AS POSSIBLE

GREEN L.E.D.s 2 OFF
ALL OTHERS RED.

RESISTORS R1 & R2
2 OFF INSULATING BEADS (PART No 630024) ASSEMBLED ON EACH LEG (AS SHOWN)





PINS OF THE DISPLAY MUST BE CUT ALONG THE LINE SHOWN, XX THEN THE PINS MUST BE BENT FROM 'A' TO 'B' BEFORE INSERTION INTO PCB

BJ

CHECKED

APPROVED

DIMENSIONS IN MILLIMETRES

2:1

SCALE

19-4 78

datron ELECTRONICS LTD NORWICH

TITLE
FRONT PCB ASSY 1061 / 1071

DRAWING SIZE
A1

DRAWING No
400294

SHEET
1 OF 6

DRAWING No	430294
FIRST USED ON	1081/71

THIRD ANGLE PROJECTION

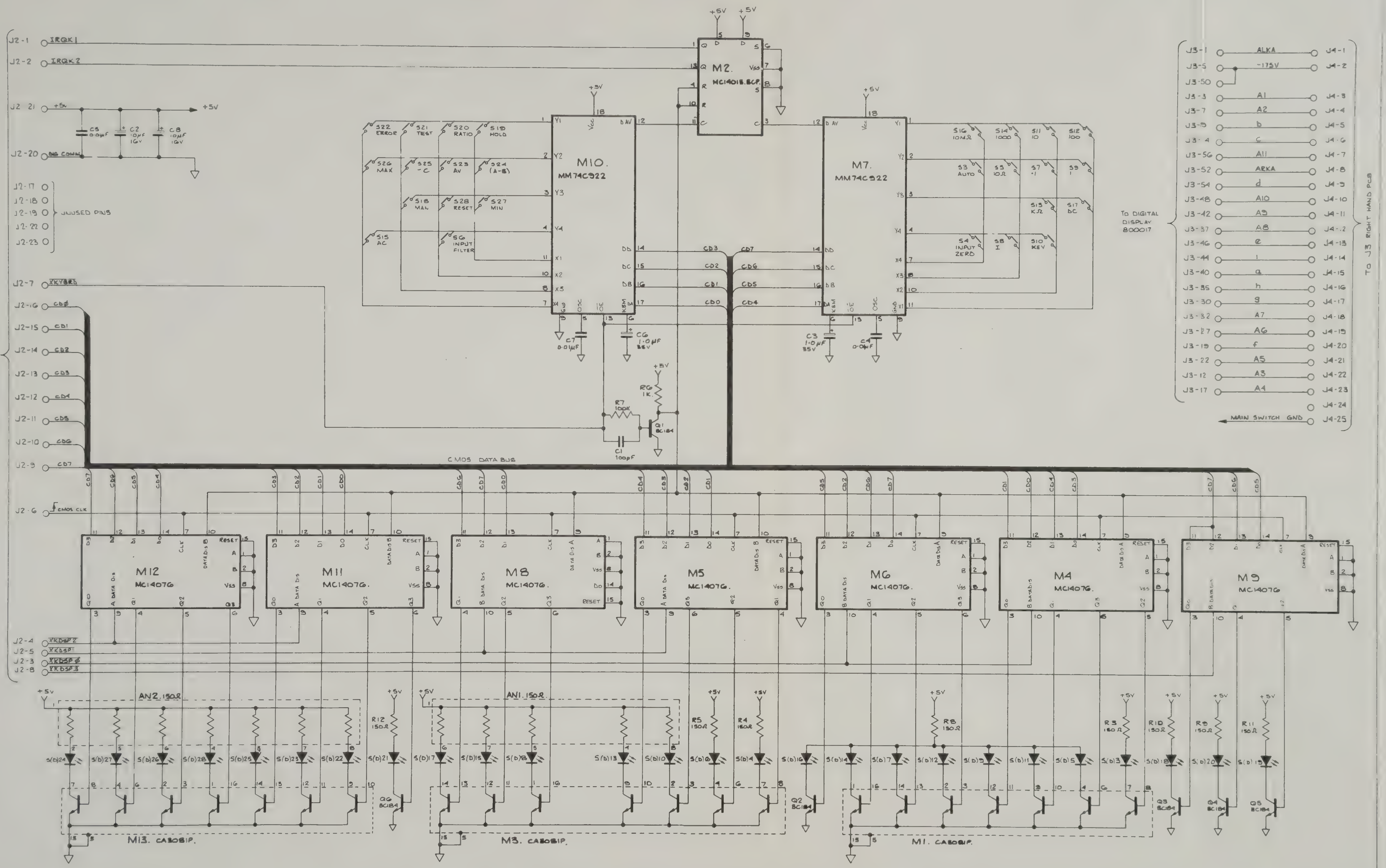
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1. SIGNAL CD1 ON J2-15 THERE IS A LINK LK2 IN THIS SIGNAL LINE

CHANGES
2 REDRAWN BJ 21-3-79
3 ECO ~~850~~ 869 CHANGE ON SHT2 BJ 11-6-79 ND
4 ECO 1111 SEE SHEET 2 IL 21.4.80 ND


J2-1 IRQK1
J2-2 IRQK2
J2-21 +5v
J2-20 SIG COMM
C5 0.01μF
C2 10μF 16V
C8 10μF 16V
+5V
J2-17
J2-18
J2-19
J2-22
J2-23
UNUSED PINS
J2-7 KYBRD
J2-16 CD0
J2-15 CD1
J2-14 CD2
J2-13 CD3
J2-12 CD4
J2-11 CD5
J2-10 CD6
J2-9 CD7
TO J1 CENTRE PCB
J2-6 CMOS CLK
J2-4 KDSP2
J2-5 KDSP1
J2-3 KDSP0
J2-8 KDSP3
CMOS DATA BUS
M2. MC14013BCP
M10. MM74C922
M7. MM74C922
S22 ERROR
S21 TEST
S20 RATIO
S19 HOLD
S26 MAX
S25 -C
S23 AV
S24 (A-B)
S18 MAN
S28 RESET
S27 MIN
S15 AC
S6 INPUT FILTER
S16 10MΩ
S14 1000
S11 10
S12 100
S3 AUTO
S5 10Ω
S7 .1
S9 1
S13 KΩ
S17 DC
S4 INPUT ZERO
S8 I
S10 KEV
C7 0.01μF
C6 1.0μF 35V
C3 1.0μF 35V
C4 0.01μF
R6 1K
R7 100K
C1 100pF
Q1 BC184
M12 MC14076
M11 MC14076
M8 MC14076
M5 MC14076
M6 MC14076
M4 MC14076
M9 MC14076
AN2 150Ω
AN1 150Ω
R12 150Ω
R5 150Ω
R4 150Ω
R8 150Ω
R3 150Ω
R10 150Ω
R9 150Ω
R11 150Ω
Q6 BC184
Q2 BC184
Q3 BC184
Q4 BC184
Q5 BC184
M13. CA3081P.
M3. CA3081P.
M1. CA3081P.
J3-1 ALKA J4-1
J3-5 -175V J4-2
J3-50
J3-3 A1 J4-3
J3-7 A2 J4-4
J3-9 b J4-5
J3-4 c J4-6
J3-56 A11 J4-7
J3-52 ARKA J4-8
J3-54 d J4-9
J3-48 A10 J4-10
J3-42 A9 J4-11
J3-37 A8 J4-12
J3-46 e J4-13
J3-44 i J4-14
J3-40 a J4-15
J3-35 h J4-16
J3-30 g J4-17
J3-32 A7 J4-18
J3-27 A6 J4-19
J3-19 f J4-20
J3-22 A5 J4-21
J3-12 A3 J4-22
J3-17 A4 J4-23
J4-24
MAIN SWITCH GND J4-25
TO DIGITAL DISPLAY 800017
TO J3 RIGHT HAND PCB

BJ DRA	CHECKED P.R.H.	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	ANGULAR ± °	MATERIAL	datron ELECTRONICS LTD. NORWICH.
	APPROVED	ALE			FINISH	TITLE FRONT PCB CIRCUIT DIAGRAM
DATE 21-3-79.	DATE	NOT TO BE SCALED				DRAWING No 430294

DRAWING SIZE A1

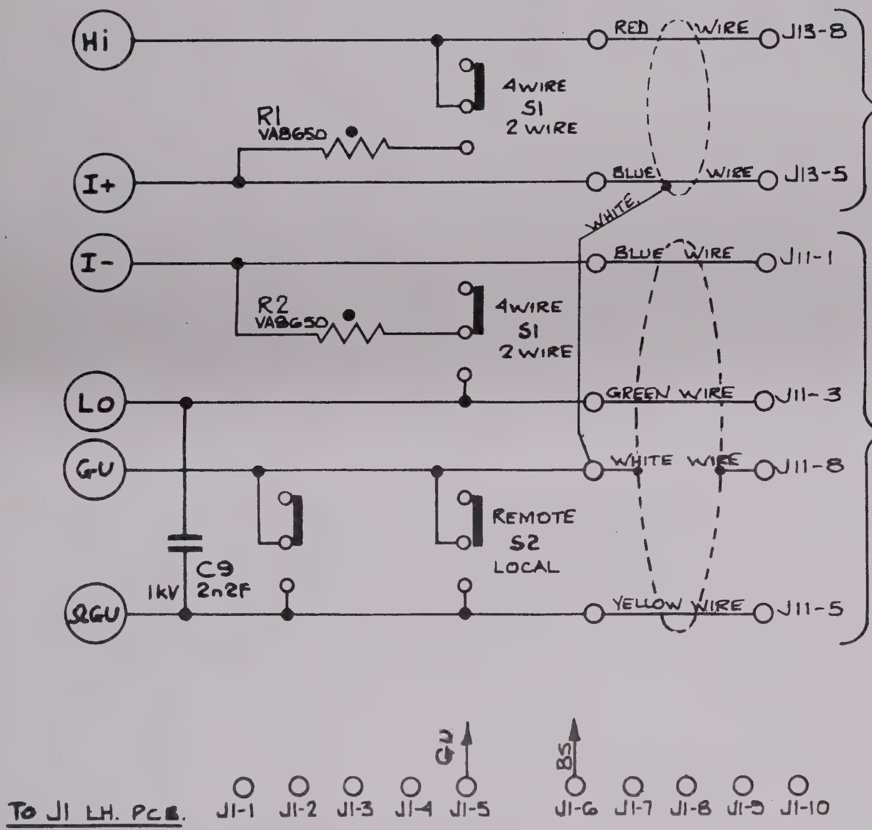
SHEET 1 OF 2

430294 THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH B.S. 308

ALL BURRS TO BE REMOVED

ISS.	CHANGES
2.	REDRAWN BJ 21.3.79
3.	ECO 899. SCREEN FOR Hi & I+ NOW CONNECTED TO G. VIA WHITE WIRE.
4	ECO. 1111 C9 ADDED IL 21.4.80


Hi
I+
I-
Lo
GU
ΩGU
R1 VA8650
R2 VA8650
4WIRE S1 2 WIRE
4WIRE S1 2 WIRE
REMOTE S2 LOCAL
C9 2n2F 1kV
RED WIRE
BLUE WIRE
WHITE
BLUE WIRE
GREEN WIRE
WHITE WIRE
YELLOW WIRE
J13-8
J13-5
J11-1
J11-3
J11-8
J11-5
To J13 REAR PCB. (VIA SIGNAL CABLE 400316) (WHEN REAR INPUT / RATIO FITTED, PLUGS IN J4 OF RATIO PCB.)
To J11 REAR PCB. (VIA SIGNAL CABLE 400310.) (WHEN REAR INPUT / RATIO FITTED, PLUGS IN J6 OF RATIO PCB.)
GU
BS
To J1 LH. PCB.
J1-1
J1-2
J1-3
J1-4
J1-5
J1-6
J1-7
J1-8
J1-9
J1-10

NOTES:

1/ G(J1-5) SCREENS ALL CIRCUITRY ON THIS SHEET.

2/ B.S. SCREENS Hi & I+.

3/ ΩG SCREENS LO & I-.

DRAWN BJ.	DATE 21-3-79	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ½° DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL —	datron ELECTRONICS LTD. NORWICH	DRAWING SIZE A4
CHKD. DEG	DATE	SCALE		FINISH —	TITLE FRONT PCB CIRCUIT DIAG.	DRAWING No. 430294	SHEET 2 OF 2
APPD.	DATE	NOT TO BE SCALED					

J.W. 1786

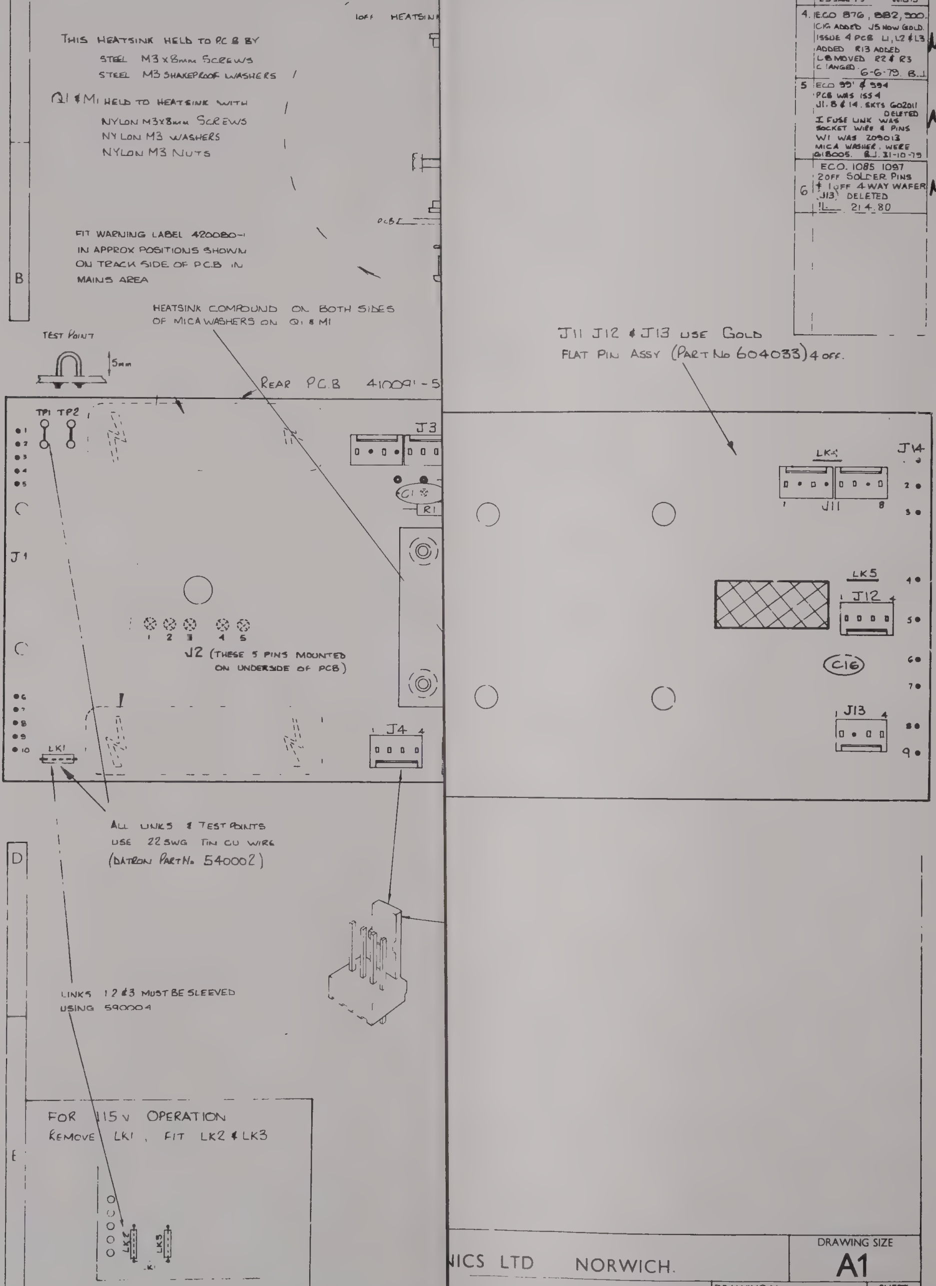
4961HT

DRAWING
400295
FIRST USED ON

THIRD ANC
DRAWN IN ACCORDANC

NOTES

ISS	CHANGES
C	
D	UPDATED PCB B.J. 22-8-78 NO
1	RELEASED TO PROD'N' 29-8-78
2	ECO 783. 8-12-78 COMPONENT CHANGES B.J. NO
3	E.C.O 816 WARNING LABEL 420080-1 ADDED 25 JAN 79 W.G.S
4.	ECO 876, 882, 900. C16 ADDED J5 NOW GOLD. ISSUE 4 PCB L1, L2 & L3 ADDED R13 ADDED L8 MOVED R2 & R3 CHANGED. 6-6-79. B.J. NO
5	ECO 991 & 994 PCB WAS ISS 4 J1, 8 & 14. SKTS 602011 DELETED I FUSE LINK WAS SOCKET WIRE & PINS W1 WAS 209013 MICA WASHER. WERE 618005. B.J. 31-10-79 NO
6	ECO. 1085 1097 2 OFF SOLDER PINS & 1 OFF 4 WAY WAFER (J13) DELETED 21.4.80 NO



THIS HEATSINK HELD TO P.C.B BY
STEEL M3 x 8mm SCREWS
STEEL M3 SHAKEPROOF WASHERS

Q1 & M1 HELD TO HEATSINK WITH
NYLON M3 x 8mm SCREWS
NYLON M3 WASHERS
NYLON M3 NUTS

FIT WARNING LABEL 420080-1
IN APPROX POSITIONS SHOWN
ON TRACK SIDE OF P.C.B IN
MAINS AREA

HEATSINK COMPOUND ON BOTH SIDES
OF MICA WASHERS ON Q1 & M1

J11 J12 & J13 USE GOLD
FLAT PIN ASSY (PART No 604033) 4 OFF.

ALL LINKS & TEST POINTS
USE 22 SWG TIN CU WIRE
(DATRON PART No. 540002)

LINKS 1 2 & 3 MUST BE SLEEVED
USING 590004

FOR 115v OPERATION
REMOVE LK1, FIT LK2 & LK3

1
4
A
B
D
E
1 OFF HEATSINK
PCB
TEST POINT
5mm
REAR P.C.B 41009'-5
TP1 TP2
J3
C1
R1
J1
1 2 3 4 5
J2 (THESE 5 PINS MOUNTED ON UNDERSIDE OF PCB)
J4
LK1
LK4
J14
J11
LK5
J12
C16
J13
LK2
LK3

NICS LTD NORWICH.

DRAWING SIZE
A1

DRAWING No
400295

SHEET
1 OF 6

MBLY 1061 / 1071

1 2

DRAWING No.
430295.
FIRST USED ON
1081/71

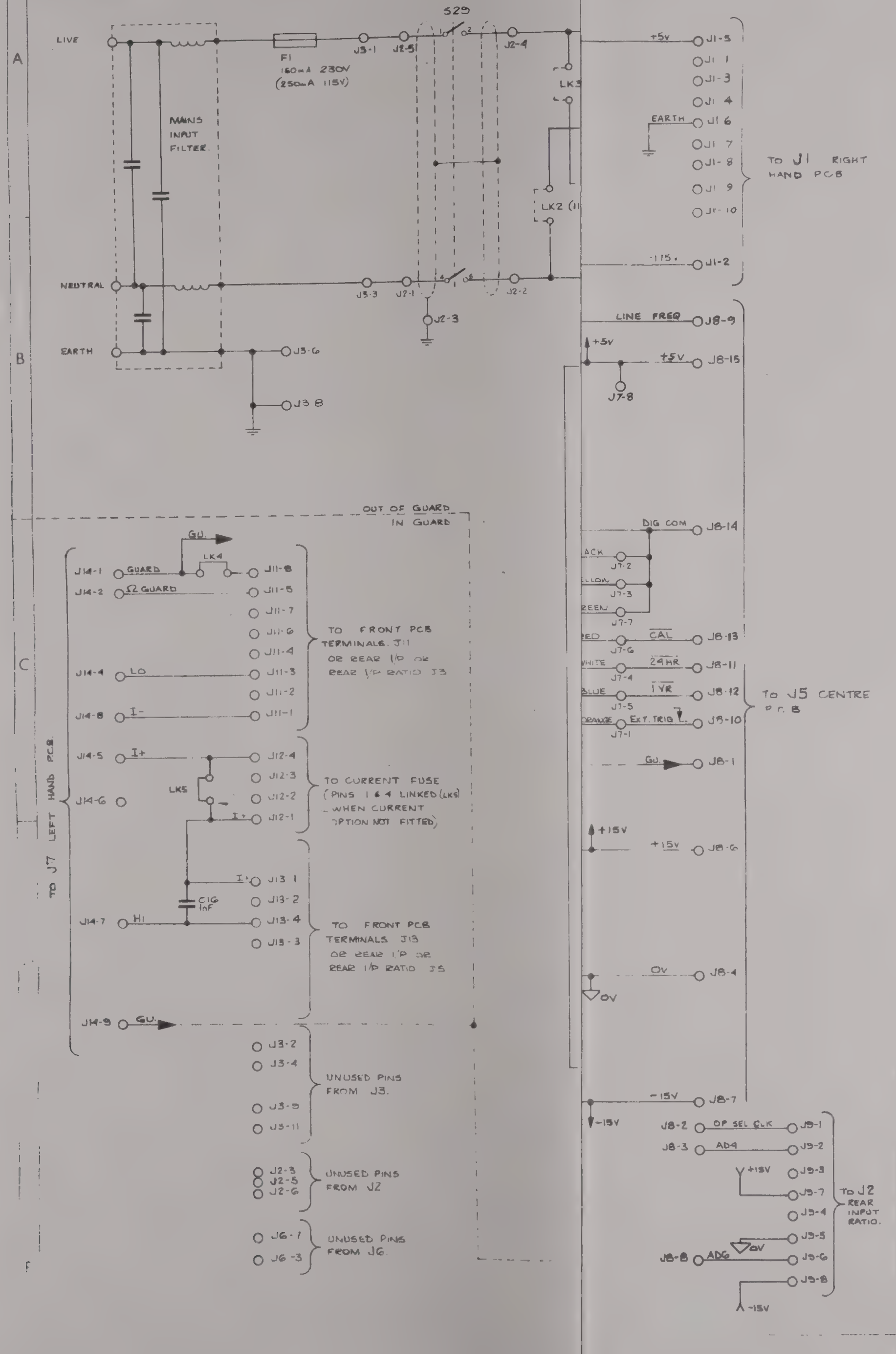
THIRD ANGLE PR

DRAWN IN ACCORDANCE WITH BS 308

T1 T2 MAINS INPUT FILTER F1, EXT TRIG OPTION ERROR SELECT & CAL ENABLE ARE ALL FITTED ON THE REAR PANEL ASSY 400309 BUT INCLUDED ON THIS CIRCUIT DIAGRAM

2	RE DRAWN 30-3-79 B.J
3	ECO 882 & 900 ADDED C16, R13, L1, L2, L3 & LK4. R3 & R2 CHANGED 8-6-79. B.J
4	ECO 991 & 994 W1 WAS W006 (230013) J8 PIN No' CHANGED. J2 " " " LK5 ADDED. B.J. J8-8 ADDED. 31-10-79
5	ECO. 1085 J13 PINS 1 TO 4 DELETED IL 21.4 80
6	ECO. 1125 FUSE IN NEUTRAL LINE TO J3-3 DELETED. IL 22.5.80

MD
MD
MD


A
B
C
F
LIVE
NEUTRAL
EARTH
MAINS INPUT FILTER.
F1
160mA 230V
(250mA 115V)
S29
J3-1
J2-5
J2-4
J3-3
J2-1
J2-2
J2-3
J3-6
J3 8
LK3
LK2 (1
+5V
J1-5
J1 1
J1-3
J1 4
EARTH
J1 6
J1 7
J1-8
J1 9
J1-10
-115
J1-2
TO J1 RIGHT HAND PCB
LINE FREQ
J8-9
+5V
J8-15
J7-8
OUT OF GUARD
IN GUARD
GU.
LK4
J14-1 GUARD
J11-8
J14-2 Ω GUARD
J11-5
J11-7
J11-6
J11-4
J14-4 LO
J11-3
J11-2
J14-8 I-
J11-1
TO FRONT PCB TERMINALS J11 OR REAR I/P OR REAR I/P RATIO J3
J14-5 I+
J12-4
J12-3
LK5
J14-6
J12-2
I+
J12-1
TO CURRENT FUSE (PINS 1 & 4 LINKED (LK5) WHEN CURRENT OPTION NOT FITTED)
I+
J13 1
J13-2
C16 1nF
J14-7 HI
J13-4
J13-3
TO FRONT PCB TERMINALS J13 OR REAR I/P OR REAR I/P RATIO J3
J14-9 GU.
TO J7 LEFT HAND PCB
J3-2
J3-4
J3-9
J3-11
UNUSED PINS FROM J3.
J2-3
J2-5
J2-6
UNUSED PINS FROM J2
J6-1
J6-3
UNUSED PINS FROM J6.
DIG COM
J8-14
ACK
J7-2
ELLOW
J7-3
REEN
J7-7
RED
CAL
J7-6
J8-13
WHITE
24HR
J7-4
J8-11
BLUE
1YR
J7-5
J8-12
ORANGE
EXT. TRIG
J7-1
J8-10
TO J5 CENTRE P.C.B
GU.
J8-1
+15V
+15V
J8-6
0V
J8-4
0V
-15V
J8-7
-15V
J8-2
OP SEL CLK
J9-1
J8-3
AD4
J9-2
+15V
J9-3
J9-7
J9-4
0V
J9-5
J8-8
AD6
J9-6
J9-8
-15V
TO J2 REAR INPUT RATIO.

LTD NORWICH

DRAWING SIZE
A1

DRAWING No.
430295

SHEET
1 OF 1

IT DIAGRAM

DRAWING No
400295
FIRST USED ON

THIRD ANGLE PROJECTION

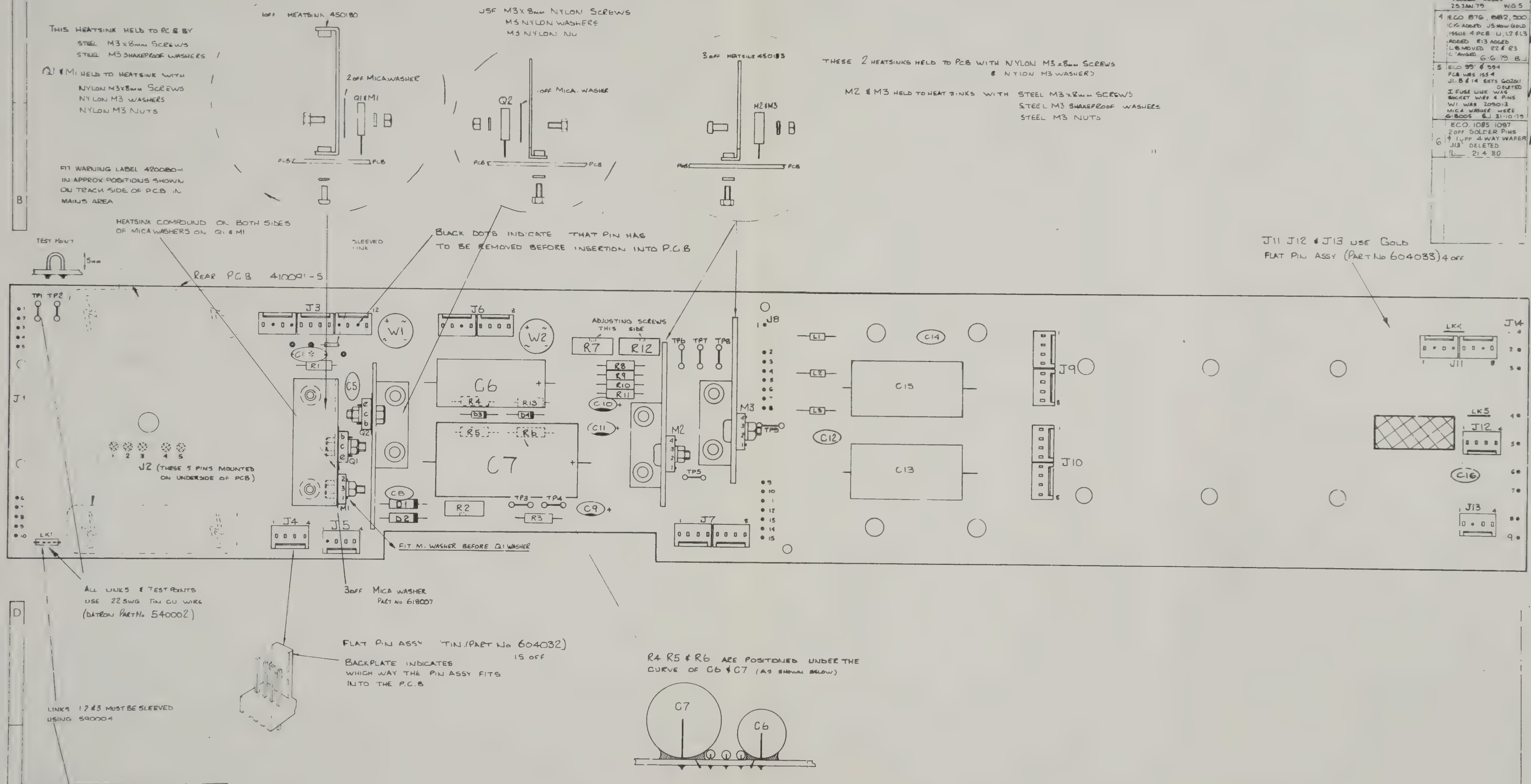
DRAWN IN ACCORDANCE WITH BS 308

4 OFF STEEL M3x8mm SCREW 611016.
9 OFF NYLON M3 x8mm SCREW. 611037
4 OFF STEEL SHAKEPROOF WASHER. 613005
9 OFF NYLON M3 WASHER . 613017
2 OFF STEEL M3 NUT . 615002
3 OFF NYLON M3 NUT . 615008

ALL BURRS TO BE REMOVED

NOTES

	CHANGES
C	
D	UPDATED PCB BJ 22-8-78
1	RELEASED TO PROD N 29-8-78
2	ECO 783 8-2-78 COMPONENT CHANGES B.J
3	ECO 816 WARNING LABEL 420080-1 ADDED 25 JAN 79 W.G.S
4	ECO 876, 882, 900. IC6 ADDED J5 NOW GOLD ISSUE 4 PCB L1, L2 & L3 ADDED R13 ADDED L8 MOVED R2 & R3 CHANGED 6-6-79 B.J
5	ECO 991 & 994 PCB WAS ISS 4 J1, 8 & 14 SKTS 602011 DELETED I FUSE LINK WAS SOCKET WIRE & PINS W1 WAS 209013 MICA WASHER WERE 618005 BJ 31-10-79
6	ECO. 1085 1097 2OFF SOLDER PINS & 1OFF 4 WAY WAFER J13 DELETED BJ 21.4.80


1OFF HEATSINK 450180
2OFF MICA WASHER
Q1 & M1
PCB
USE M3 X 8mm NYLON SCREWS
M3 NYLON WASHERS
M3 NYLON NU
1OFF MICA. WASHER
Q2
3OFF HEATSINK 450183
M2 & M3
TEST POINT
5mm
SLEEVED LINK
TP1 TP2
J3
J6
W1
W2
ADJUSTING SCREWS THIS SIDE
R7
R12
R8
R9
R10
R11
TP6 TP7 TP8
J8
L1
L2
L3
C14
C15
C13
J9
J10
J11
J12
J13
J14
LK4
LK5
C1
R1
C5
C6
R4
R13
D3
D4
C10
C11
R5
R6
C7
M2
M3
TP9
TP5
C12
C16
Q1
M1
J1
J2 (THESE 5 PINS MOUNTED ON UNDERSIDE OF PCB)
C8
D1
D2
R2
TP3
TP4
R3
C9
J4
J5
J7
LK1
LK2
LK3

THIS HEATSINK HELD TO P.C.B BY
STEEL M3 x 8mm SCREWS
STEEL M3 SHAKEPROOF WASHERS

Q1 & M1 HELD TO HEATSINK WITH
NYLON M3X8mm SCREWS
NYLON M3 WASHERS
NYLON M3 NUTS

THESE 2 HEATSINKS HELD TO PCB WITH NYLON M3 x8mm SCREWS
& NYLON M3 WASHERS

M2 & M3 HELD TO HEAT SINKS WITH STEEL M3 x8mm SCREWS
STEEL M3 SHAKEPROOF WASHERS
STEEL M3 NUTS

FIT WARNING LABEL 420080-1 IN APPROX POSITIONS SHOWN ON TRACK SIDE OF P.C.B IN MAINS AREA

HEATSINK COMPOUND ON BOTH SIDES OF MICA WASHERS ON Q1 & M1

REAR PCB 410091-5

BLACK DOTS INDICATE THAT PIN HAS TO BE REMOVED BEFORE INSERTION INTO P.C.B

J11 J12 & J13 USE GOLD FLAT PIN ASSY (PART No 604033) 4 OFF

FIT M1 WASHER BEFORE Q1 WASHER

ALL LINKS & TEST POINTS USE 22SWG TIN CU WIRE (DATRON PART No 540002)

3OFF MICA WASHER PART No 618007

FLAT PIN ASSY TIN (PART No 604032) 15 OFF

BACKPLATE INDICATES WHICH WAY THE PIN ASSY FITS INTO THE P.C.B

R4 R5 & R6 ARE POSITIONED UNDER THE CURVE OF C6 & C7 (AS SHOWN BELOW)

LINKS 1 2 & 3 MUST BE SLEEVED USING 590004

FOR 115V OPERATION
REMOVE LK1, FIT LK2 & LK3

THE 4 LARGE CAPACITORS C6 C7 C13 & C15 ARE TO BE BEDDED INTO SILICONE RUBBER COMPOUND PART No 900004 BEFORE SOLDERING THIS SHOULD FINISH UP AS ABOVE DRAWING

DRAWN	B J
CHECKED	MAH
DATE	26-4-78
DIMENSIONS IN	
SCALE	2:1 NOT TO BE SCALED

TOLERANCES ANGULAR ± °
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± .005
DECIMAL TO 2 PLACES .010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES 1mm
DECIMAL TO 1 PLACE 2mm
WHOLE DIMENSIONS 4mm
UNLESS OTHERWISE STATED

MATERIAL
FINISH

datron ELECTRONICS LTD NORWICH.

TITLE
REAR P.C.B. ASSEMBLY 1061/1071

DRAWING SIZE A1
DRAWING No 400295
SHEET 1 of 6

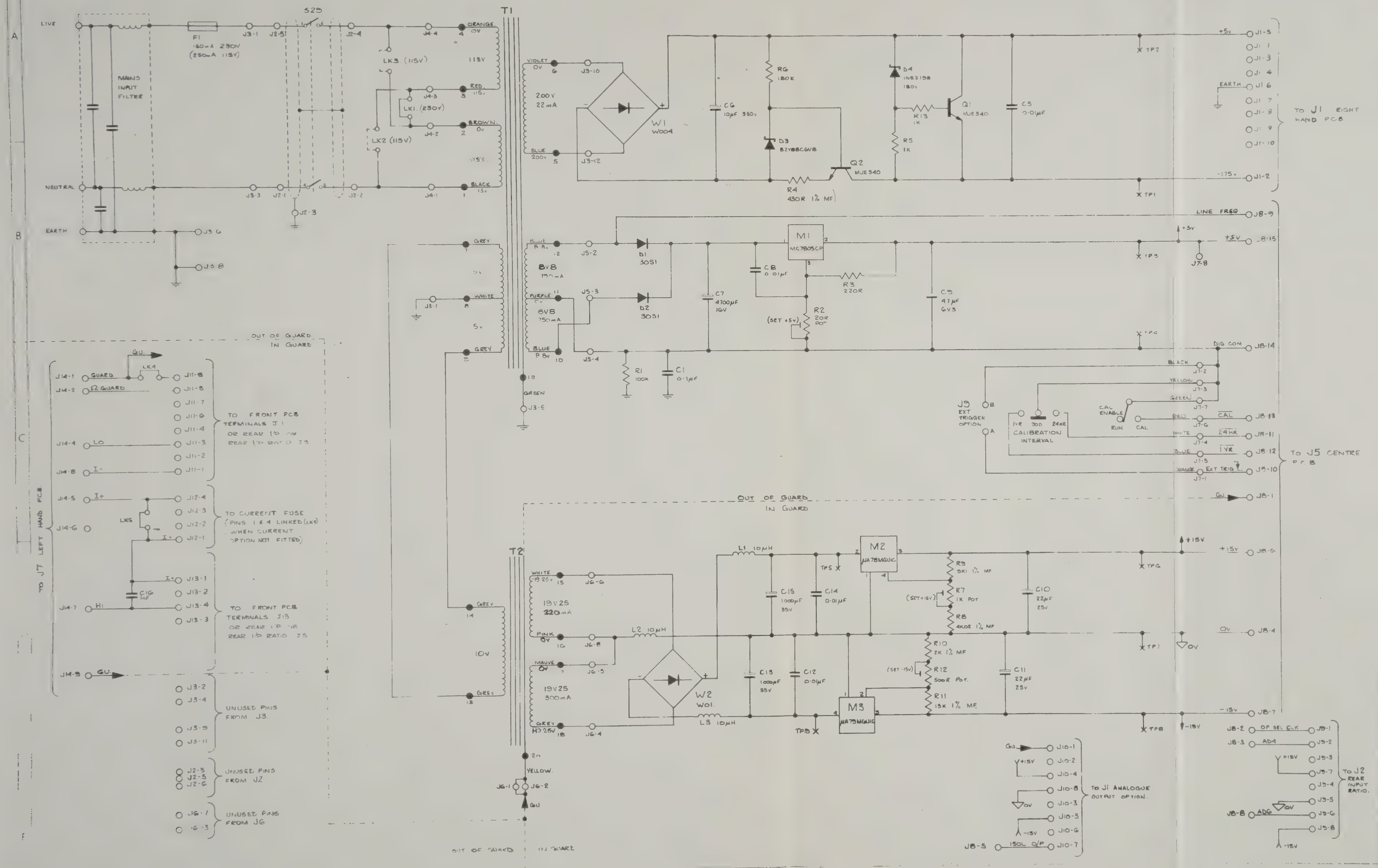
DRAWING No
430295
FIRST USED ON
1081/71

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

1 T1, T2 MAINS INPUT FILTER, F1, EXT TRIG. OPTION ERROR SELECT & CAL ENABLE ARE ALL FITTED ON THE REAR PANEL ASSY 400309 BUT INCLUDED ON THIS CIRCUIT DIAGRAM

2	RE DRAWN 30-3-79 BJ
3	ECO 882 & 900 ADDED C16, R13, L1, L2, L3 & LK4. R3 & R2 CHANGED 8-6-79 BJ
4	ECO 991 & 994 W1 WAS W006 (290013) J8 PIN No' CHANGED J2 " " " LK5 ADDED. BJ. J8-8 ADDED 31-10-79
5	ECO 1085 J13 PINS 1 TO 4 DELETED IL 21 4 80
6	ECO 1125 FUSE IN NEUTRAL LINE TO J3-3 DELETED IL 22.5.80



1
2
3
4
A
B
C
LIVE
NEUTRAL
EARTH
MAINS INPUT FILTER
F1
160mA 230V
(250mA 115V)
S29
J3-1
J2-5
J2-4
J4-4
J3-3
J2-1
J2-2
J4-1
J2-3
J3-6
J3-8
LK3 (115V)
LK1 (230V)
LK2 (115V)
J4-3
J4-2
T1
ORANGE
0V
115V
RED
115V
BROWN
0V
BLACK
VIOLET 0V
200V 22mA
BLUE 200V
J3-10
J3-12
W1
W004
C6 10µF 350V
R6 180K
D3 BZY88C6V8
R4 430R 1% MF
Q2 MJE340
D4 1N5219B 180V
R13 1K
R5 1K
Q1 MJE340
C5 0.01µF
+5V
+175V
TP1
TP2
J1-5
J1-1
J1-3
J1-4
J1-6
J1-7
J1-8
J1-9
J1-10
J1-2
EARTH
TO J1 RIGHT HAND PCB
LINE FREQ
J8-9
GREY
WHITE
5V
J3-7
BLUE 8.8
8V8 750mA
PURPLE
6V8 750mA
BLUE 8.8V
J5-2
J5-3
J5-4
D1 30S1
D2 30S1
C7 4700µF 16V
C8 0.01µF
M1 MC7805CP
R3 220R
R2 20R POT
(SET +5V)
C9 47µF 6V3
R1 100K
C1 0.1µF
GREEN
J3-5
TP3
TP4
+5V
J8-15
J7-8
DIG COM
J8-14
BLACK
YELLOW
GREEN
RED
WHITE
BLUE
WHITE
J7-2
J7-3
J7-7
J7-6
J7-4
J7-5
J7-1
J9 EXT TRIGGER OPTION
B
A
CAL ENABLE
RUN
CAL
1YR
90D
24HR
CALIBRATION INTERVAL
CAL
24HR
1YR
EXT TRIG
J8-13
J8-11
J8-12
J8-10
TO J5 CENTRE PCB
OUT OF GUARD
IN GUARD
GU
J8-1
J14-1
J14-2
GUARD
Ω GUARD
LK4
J11-8
J11-5
J11-7
J11-6
J11-4
J11-3
J11-2
J11-1
J14-4
LO
J14-8
I-
TO FRONT PCB TERMINALS J1 OR REAR I/P OR REAR I/P RATIO J3
J14-5
I+
J14-6
LK5
J12-4
J12-3
J12-2
J12-1
TO CURRENT FUSE (PINS 1 & 4 LINKED (LK5) WHEN CURRENT OPTION NOT FITTED)
TO J7 LEFT HAND PCB
J13-1
J13-2
J13-4
J13-3
C16 1nF
J14-7
HI
TO FRONT PCB TERMINALS J13 OR REAR I/P OR REAR I/P RATIO J3
J14-9
GU
J3-2
J3-4
J3-9
J3-11
UNUSED PINS FROM J3.
J2-3
J2-5
J2-6
UNUSED PINS FROM J2
J6-1
J6-3
UNUSED PINS FROM J6
T2
WHITE -19.25V
19V25 220mA
PINK 0V
MAUVE 0V
19V25 300mA
GREY +19.25V
J6-6
J6-8
J6-5
J6-4
GREY
10V
GREY
YELLOW
J6-1
J6-2
GU
W2 W01
L1 10µH
L2 10µH
L3 10µH
C15 1000µF 35V
C14 0.01µF
C13 1000µF 35V
C12 0.01µF
M2 µA78MGUIC
M3 µA79MGUIC
R9 5K1 1% MF
R7 1K POT
(SET +15V)
R8 4K02 1% MF
R10 2K 1% MF
R12 500R POT
(SET -15V)
R11 13K 1% MF
C10 22µF 25V
C11 22µF 25V
TP5
TP6
TP7
TP8
+15V
0V
-15V
J8-6
J8-4
J8-7
GU
J10-1
+15V
J10-2
J10-4
J10-8
0V
J10-3
J10-5
-15V
J10-6
J8-5
ISOL O/P
J10-7
TO J1 ANALOGUE OUTPUT OPTION.
J8-2
OP SEL CLK
J9-1
J8-3
ADA
J9-2
+15V
J9-3
J9-7
J9-4
J9-5
J8-8
ADG
0V
J9-6
J9-8
-15V
TO J2 REAR INPUT RATIO.
OUT OF GUARD
IN GUARD

30-3-78.

	ANGULAR	MATERIAL
NS		
O 3 PLACES ±	005	
O 2 PLACES ±	010	
AL ±	1/64	
IONS		FINISH
O 2 PLACES ±	1mm	
O 1 PLACE ±	2mm	
MENSIONS ±	4mm	
WISE STATED		

datron ELECTRONICS LTD NORWICH

REAR PCB (INCLUDING REAR PANEL) CIRCUIT DIAGRAM

DRAWING SIZE
A1

DRAWING No
430295

SHEET
1 OF 1

DRAWING No
400296.
FIRST USED ON
1061 /1071

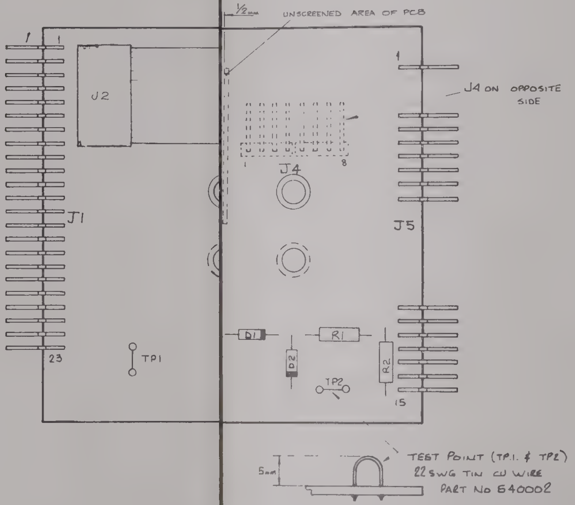
THIRD ANGL
DRAWN IN ACCORDANCE V

NOTES

ISS.	CHANGES
C	
D	D1, D2, D3, R1 & R2 ADDED IE NEW ISS PCB BJ 25-8-78
1	RELEASED TO PROD'N' 29-9-78
2	ECO 784 RIBBON CABLE MODS BJ 6-12-78
3	ECO 849 PCB MODS BJ 4-5-79
4	ECO 867 PCB UPDATE BJ 11-6-79 & ECO 904 572130 CHANGE TO 572100/A. 606006 CLIPS REMOVED. & ECO 876 J3, 4 & 6 NOW GOLD NOT TIN
5	ECO 992 26-10-79 PCB WAS ISS 4A BJ. PIN 8 OF J5 ADDED PCB CUT OUT INCREASED IN DEPTH
6	ECO 1000 RIBBON CABLE ASSY WAS 572100/A IL 18.1.80
7	ECO 1102 PCB WAS ISSUE 5 IL 14 4 80
8	ECO 1217 RIBBON CABLE WAS 572130/B JR 18 8 81

IMPORTANT

4 OFF AMP PIN (BLOCKS) F GOLD RIGHT ANGLED PIN ASSY (PART No 604035)
ENSURE ALL PINS PLACED TOGETHER AS SHOWN BELOW.
NOTE. PINS ARE HEL
TO SUIT THE



TEST POINT (TP.1. & TP2)
22 SWG TIN CU WIRE
PART No 640002

NICS LTD. NORWICH.

DRAWING SIZE
A1

ASSEMBLY.

DRAWING No.
400296

SHEET
1 OF 2

1	2	6

DRAWING No.
430296

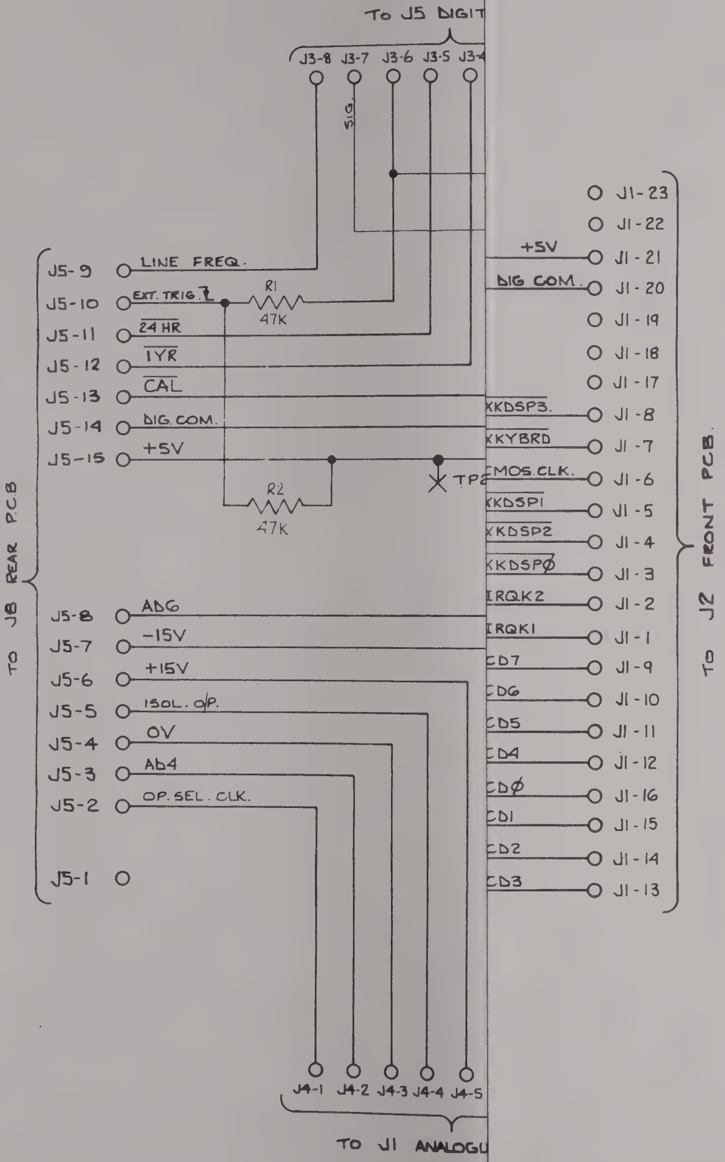
FIRST USED ON
1061 / 1071

THIRD ANGL
DRAWN IN ACCORDANCE W

NOTES

KS TO BE ON CCT. SIDE (SHT. 2) &
TRACKS TO BE ON THE COMP.
P.C.B. WHERE POSSIBLE.

ISS.	CHANGES
D	
1c	RELEASED TO PROD'N 29-9-78.
2	ECO. 840. J6-4 SIG JOINED TO J5-7. B.J. 4-5-79.
3	ECO 992. B.J. J5-8 ADDED & J5-1 GU. DELETED 29-10-79



A
B
C
D
TO J5 DIGIT
J3-8
J3-7
J3-6
J3-5
J3-4
SIG.
TO J8 REAR P.C.B
J5-9
J5-10
J5-11
J5-12
J5-13
J5-14
J5-15
J5-8
J5-7
J5-6
J5-5
J5-4
J5-3
J5-2
J5-1
LINE FREQ.
EXT. TRIG
R1
47K
24 HR
1YR
CAL
DIG. COM.
+5V
R2
47K
TP2
ADG
−15V
+15V
ISOL. O/P.
0V
AD4
OP. SEL. CLK.
+5V
DIG COM.
KKDSP3
KKYBRD
CMOS. CLK.
KKDSP1
KKDSP2
KKDSP0
IRQK2
IRQK1
CD7
CD6
CD5
CD4
CD0
CD1
CD2
CD3
J1-23
J1-22
J1-21
J1-20
J1-19
J1-18
J1-17
J1-8
J1-7
J1-6
J1-5
J1-4
J1-3
J1-2
J1-1
J1-9
J1-10
J1-11
J1-12
J1-16
J1-15
J1-14
J1-13
TO J2 FRONT PCB
J4-1
J4-2
J4-3
J4-4
J4-5
TO J1 ANALOGU

DRAWN BJ.	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± DECIMAL TO 2 PLACES ± FRACTIONAL ± METRIC DIMENSIONS DECIMAL TO 2 PLACES ± DECIMAL TO 1 PLACE ± WHOLE DIMENSIONS ± UNLESS OTHERWISE STATED	ANG
TRACED	APPROVED	SCALE NOT TO BE SCALED		
DATE 30-5-78	DATE			

L.W.1162

WICH.

DRAWING SIZE
A2

DRAWING No.
430296

SHEET
1 OF 1

DRAWING No
400296.
FIRST USED ON
1061 /1071

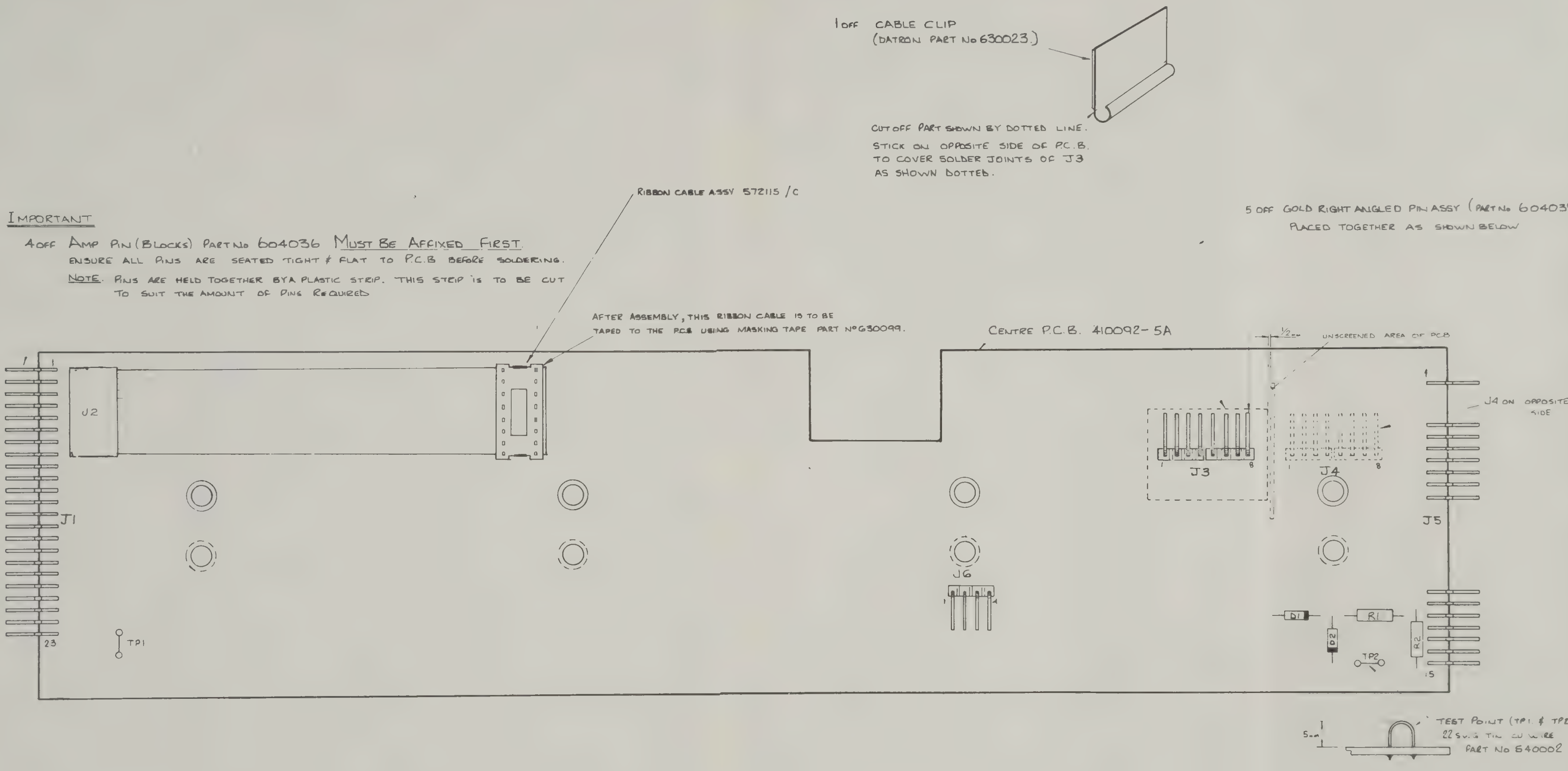
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
C	
D	D1, D2, D3, R1 & R2 ADDED I & NEW 33 PCB B J 25·8 78 MD
1	RELEASED TO PROD N 29·9·78
2	ECO 784 RIBBON CABLE MODS BJ 6·12·78 MD
3	ECO 849 PCB MODS BJ 4 5·79 MD
4	ECO 867 PCB UPDATE BJ 11-6-79 & ECO 904 572130 CHANGE TO 572100/A 606006 CLIPS REMOVED & ECO 876 J3, 4 & 6 NOW GOLD NOT TIN MD
5	ECO 992 26-10-79 PCB WAS ISS 4A BJ PIN 8 OF J5 ADDED PCB CUT OUT INCREASED IN DEPTH MD
6	ECO 1000 RIBBON CABLE ASSY WAS 572100/A IL 18.1.80 MD
7	ECO 1102 PCB WAS ISSUE 5 IL 14 4 80 MD
8	ECO 1217 RIBBON CABLE WAS 572130/B JR 18 8 81 MD



1 OFF CABLE CLIP
(DATRON PART No 630023.)

CUT OFF PART SHOWN BY DOTTED LINE.
STICK ON OPPOSITE SIDE OF P.C.B.
TO COVER SOLDER JOINTS OF J3
AS SHOWN DOTTED.

RIBBON CABLE ASSY 572115 /C

IMPORTANT

4 OFF AMP PIN (BLOCKS) PART No 604036 MUST BE AFFIXED FIRST.
ENSURE ALL PINS ARE SEATED TIGHT & FLAT TO P.C.B BEFORE SOLDERING.
NOTE. PINS ARE HELD TOGETHER BY A PLASTIC STRIP. THIS STRIP IS TO BE CUT TO SUIT THE AMOUNT OF PINS REQUIRED

AFTER ASSEMBLY, THIS RIBBON CABLE IS TO BE TAPED TO THE PCB USING MASKING TAPE PART No 630099.

CENTRE P.C.B. 410092-5A

5 OFF GOLD RIGHT ANGLED PIN ASSY (PART No 604035)
PLACED TOGETHER AS SHOWN BELOW

TEST POINT (TP1 & TP2)
22 SWG TIN CU WIRE
PART No 540002

DRAWN B.J.	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED ANGULAR ± °	MATERIAL FINISH	datron ELECTRONICS LTD. NORWICH. TITLE 1061/1071 CENTRE P.C.B ASSEMBLY.
TRACED	APPROVED	SCALE 2 : 1 NOT TO BE SCALED			DRAWING SIZE A1
DATE 25-4-78	DATE				DRAWING No 400296 SHEET 1 OF 2

DRAWING No.
430296

FIRST USED ON
1061 / 1071

THIRD ANGLE PROJECTION

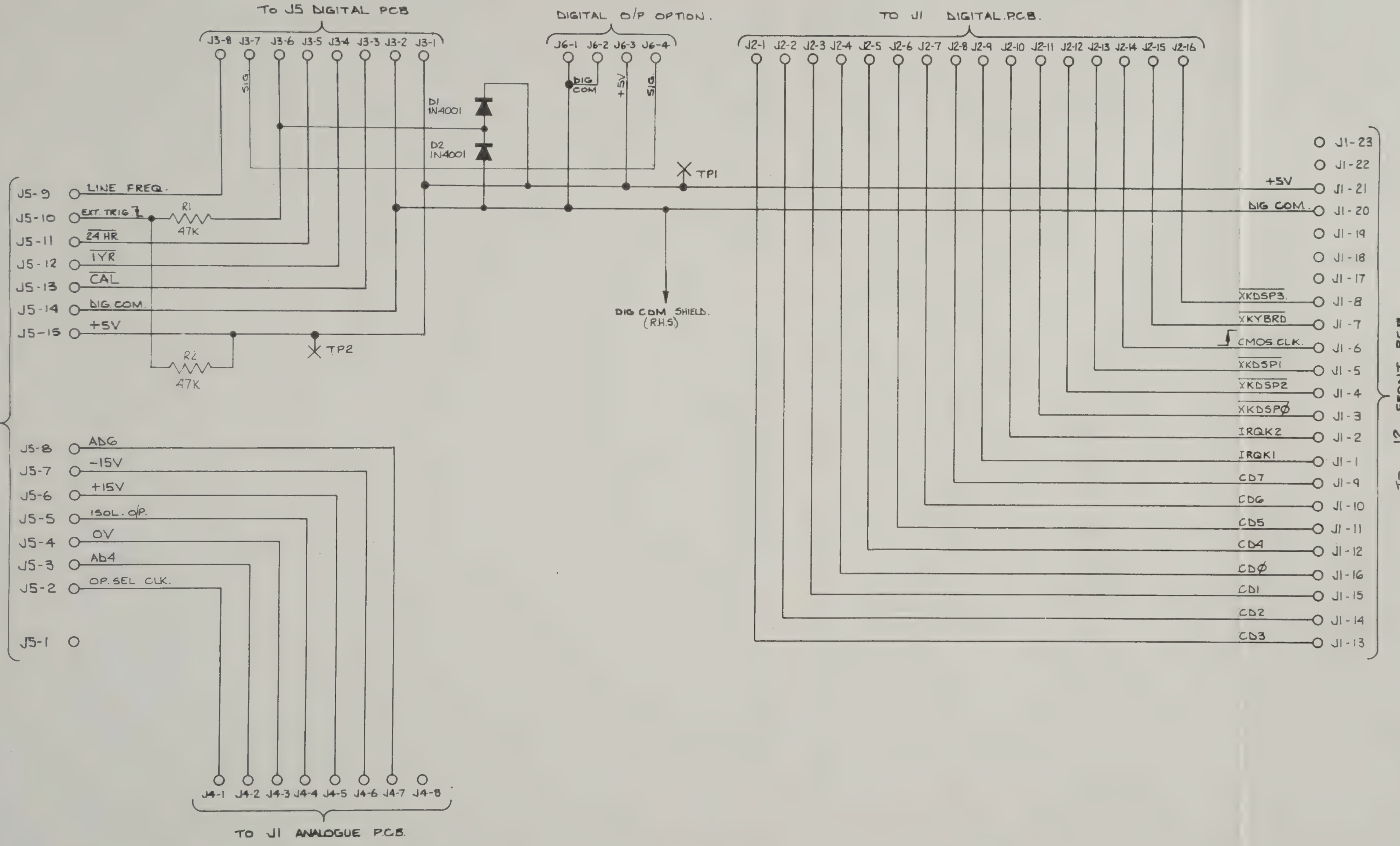
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1. "IN GUARD" TRACKS TO BE ON CCT. SIDE (SHT. 2) & "OUT OF GUARD" TRACKS TO BE ON THE COMP. SIDE (SHT. 3) OF P.C.B. WHERE POSSIBLE.

ISS.	CHANGES
0	
1	RELEASED TO PROD. 29-9-78.
2	ECO. 840. J6-4 SIG JOINED TO J5-7. B.J. 4-5-79.
3	ECO 952. B.J. J5-8 ADDED & J5-1 GU. DELETED 29-10-79



1
2
3
4
5
6
A
B
C
D
TO J5 DIGITAL PCB
J3-8
J3-7
J3-6
J3-5
J3-4
J3-3
J3-2
J3-1
SIG
D1 1N4001
D2 1N4001
DIGITAL O/P OPTION.
J6-1
J6-2
J6-3
J6-4
DIG COM
+5V
SIG
TP1
TO J1 DIGITAL P.C.B.
J2-1
J2-2
J2-3
J2-4
J2-5
J2-6
J2-7
J2-8
J2-9
J2-10
J2-11
J2-12
J2-13
J2-14
J2-15
J2-16
J5-9
LINE FREQ.
J5-10
EXT. TRIG
R1
47K
J5-11
24 HR
J5-12
1YR
J5-13
CAL
J5-14
DIG COM.
J5-15
+5V
TP2
R2
47K
DIG COM SHIELD. (R.H.S)
TO J8 REAR P.C.B
J5-8
ADG
J5-7
-15V
J5-6
+15V
J5-5
ISOL. O/P.
J5-4
0V
J5-3
AD4
J5-2
OP. SEL CLK.
J5-1
J4-1
J4-2
J4-3
J4-4
J4-5
J4-6
J4-7
J4-8
TO J1 ANALOGUE P.C.B.
J1-23
J1-22
+5V
J1-21
DIG COM.
J1-20
J1-19
J1-18
J1-17
XKDSP3
J1-8
XKYBRD
J1-7
CMOS CLK.
J1-6
XKDSP1
J1-5
XKDSP2
J1-4
XKDSP0
J1-3
IRQK2
J1-2
IRQK1
J1-1
CD7
J1-9
CD6
J1-10
CD5
J1-11
CD4
J1-12
CD0
J1-16
CD1
J1-15
CD2
J1-14
CD3
J1-13
TO J2 FRONT PCB.

DRAWN B.J.	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ½° INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± ·010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL
TRACED	APPROVED	SCALE NOT TO BE SCALED		FINISH
DATE 30-5-78	DATE			

LW 1962

datron ELECTRONICS LTD. NORWICH.

TITLE	DRAWING No.	DRAWING SIZE	SHEET
CENTRE PCB SCHEMATIC 1061 / 1071	430296	A2	1 OF 1

1 | 2 | 7

DRAWING No.
400297.
FIRST USED ON
1061 /71

THIRD ANGL

DRAWN IN ACCORDANCE V

NOTES

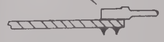
ISS.	CHANGES
C	–
D	NEW ISSUE P.C.B. BJ. 24-8-78 MD
1	RELEASED TO PROD'N 29-9-78
2	ECO 867 PCB UPDATE BJ 11-6-79. MD

A

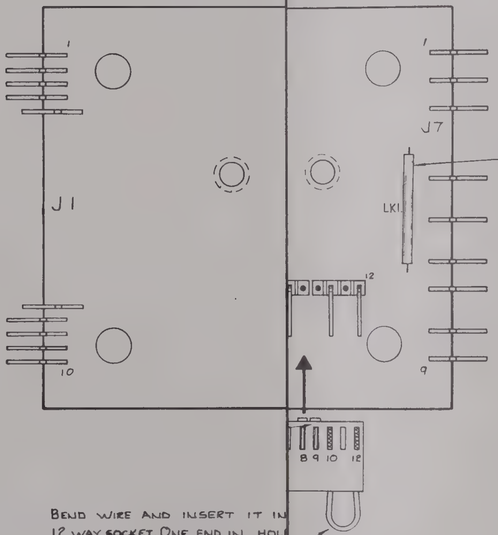
PORTANT.

AMP PINS (PART No 604036)
MUST BE AFFIXED FIRST.
ENSURE ALL PINS ARE SEATED TIGHT & FLAT
TO P.C.B BEFORE SOLDERING.

E PINS ARE HELD TOGETHER BY A PLASTIC STRIP.
THIS STRIP IS TO BE CUT TO SUIT THE AMOUNT
OF PINS REQUIRED.



B



THIS LINK TO BE
COVERED WITH SLEEVE
PART No 590001.

C

D

BEND WIRE AND INSERT IT IN
12 WAY SOCKET. ONE END IN HOL
THE OPPOSITE END INTO HOLE '5

HOLES 10 & 12 OF SOCKET.
S SHOWN ABOVE.

AFFIX 7 OFF GOLD CRIMP PIN
(PART No 605057) ONE
EACH END OF WIRES,
THE 7TH INTO PIN 12 OF SOC

E

3 OFF. 40mm OF BROWN WIRE
(PART No 510111) AND STRIP
FROM EACH END (AS SHO

ONICS LTD. NORWICH.

DRAWING SIZE
A1

.B ASSEMBLY

DRAWING No.
400297

SHEET
1 OF

IW116

DRAWING No.
430297
FIRST USED ON
1061 / 1071

THIRD ANGL

DRAWN IN ACCORDANCE WE

NOTES

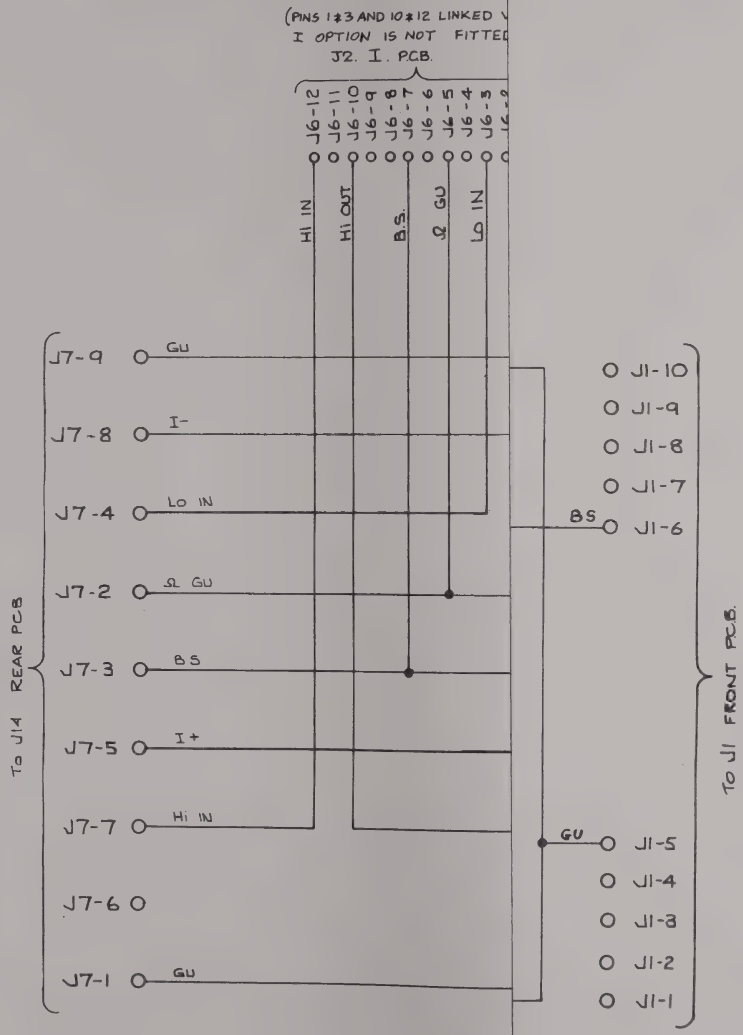
TO BE ON THE COMPONENT
E OF P.C.B WHERE POSSIBLE.

D, VIA J7-1 TO PROVIDE
IC SHIELD ON CIRCUIT (SHEET 2)
WHERE POSSIBLE.

5, TO ENCLOSE Hi AND I+
P.C.B WHERE POSSIBLE.

VIA J3-3 TO ENCLOSE LO & I-
P.C.B WHERE POSSIBLE.

ISS.	CHANGES
D	
1	RELEASED TO PROD 'N'. 29-9-78


(PINS 1 & 3 AND 10 & 12 LINKED V
I OPTION IS NOT FITTED
J2. I. P.C.B.
J6-12
J6-11
J6-10
J6-9
J6-8
J6-7
J6-6
J6-5
J6-4
J6-3
Hi IN
Hi OUT
B.S.
Ω GU
LO IN
J7-9
GU
J7-8
I-
J7-4
LO IN
J7-2
Ω GU
J7-3
BS
J7-5
I+
J7-7
Hi IN
J7-6
J7-1
GU
To J14 REAR PCB
J1-10
J1-9
J1-8
J1-7
BS
J1-6
GU
J1-5
J1-4
J1-3
J1-2
J1-1
To J1 FRONT P.C.B.

DRAWN	CHECKED	DIMENSIONS IN
B.J.		MILLIMETRES
TRACED	APPROVED	SCALE
DATE 30.5.78	DATE	NOT TO BE SCALED

TOLERANCES ANGU
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± ·0
DECIMAL TO 2 PLACES ± ·0
FRACTIONAL ± 1/
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1
DECIMAL TO 1 PLACE ± 2
WHOLE DIMENSIONS ∓ 4
UNLESS OTHERWISE STATED

WICH.

DRAWING SIZE
A2

DRAWING No.
430297

SHEET
1 OF 1

DRAWING No
400297.
FIRST USED ON 1061 /71

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

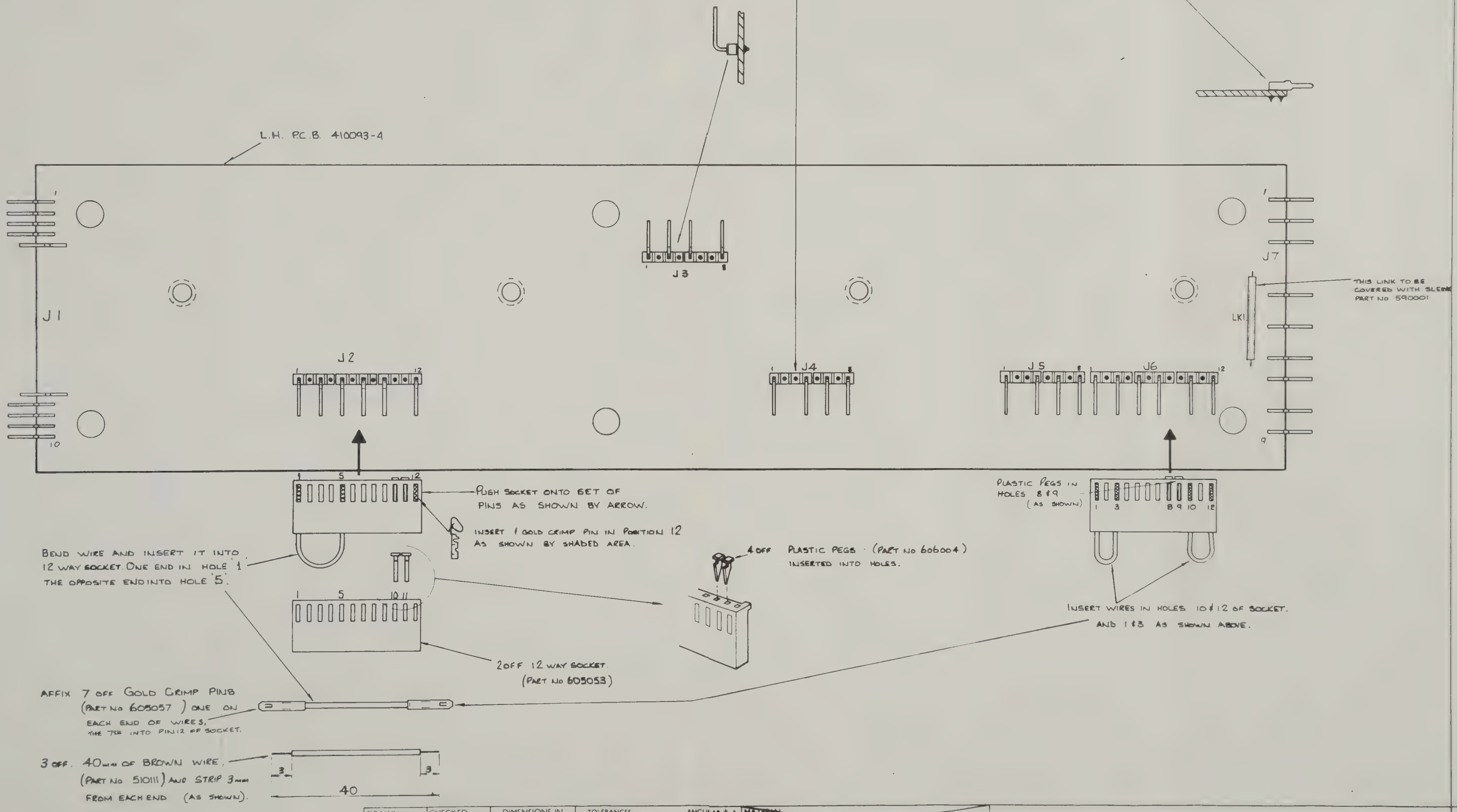
ISS.	CHANGES	
C	–	
D	NEW ISSUE P.C.B. BJ. 24-8-78	NO
1	RELEASED TO PROD N 25-9-78	
2	ECO 867 PCB UPDATE BJ 11-6-79	NO

IMPORTANT.

2 OFF. AMP PINS (PART No 604036)
MUST BE AFFIXED FIRST
ENSURE ALL PINS ARE SEATED TIGHT & FLAT TO P.C.B BEFORE SOLDERING.

NOTE PINS ARE HELD TOGETHER BY A PLASTIC STRIP THIS STRIP IS TO BE CUT TO SUIT THE AMOUNT OF PINS REQUIRED

USE THE GOLD 4 RIGHT ANGLED PIN ASSY (PART NO 604035).12 OFF.
PLACED TOGETHER TO MAKE UP THE REQUIRED AMOUNT OF CONTACTS (SHOWN BELOW).
REMOVE PINS IN PLACES SHOWN BY BLACK DOTS.



THIS LINK TO BE COVERED WITH SLEE
PART No 590001

PUSH SOCKET ONTO SET OF PINS AS SHOWN BY ARROW.

INSERT 1 GOLD CRIMP PIN IN POSITION 12 AS SHOWN BY SHADED AREA.

BEND WIRE AND INSERT IT INTO 12 WAY SOCKET. ONE END IN HOLE '1' THE OPPOSITE END INTO HOLE '5'.

4 OFF PLASTIC PEGS (PART NO 606004) INSERTED INTO HOLES.

PLASTIC PEGS IN HOLES 8 & 9 (AS SHOWN)

INSERT WIRES IN HOLES 10 & 12 OF SOCKET. AND 1 & 3 AS SHOWN ABOVE.

2 OFF 12 WAY SOCKET. (PART No 605053)

AFFIX 7 OFF GOLD CRIMP PINS (PART No 605057) ONE ON EACH END OF WIRES, THE 7TH INTO PIN 12 OF SOCKET.

3 OFF. 40mm OF BROWN WIRE, (PART No 510111) AND STRIP 3mm FROM EACH END (AS SHOWN).

DRAWN	CHECKED	DIMENSIONS IN
B.J		MILLIMETRES
TRACED	APPROVED	SCALE 2 : 1 NOT TO BE SCALED
DATE 21-4-78	DATE	

TOLERANCES ANGULAR ± ½°
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± 005
DECIMAL TO 2 PLACES ± 010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm.
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED

MATERIAL

FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE
1061 /71 L.H. P.C.B ASSEMBLY

DRAWING SIZE A1

DRAWING No. 400297

SHEET 1 OF

DRAWING No.
430297
FIRST USED ON
1061 /1071

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

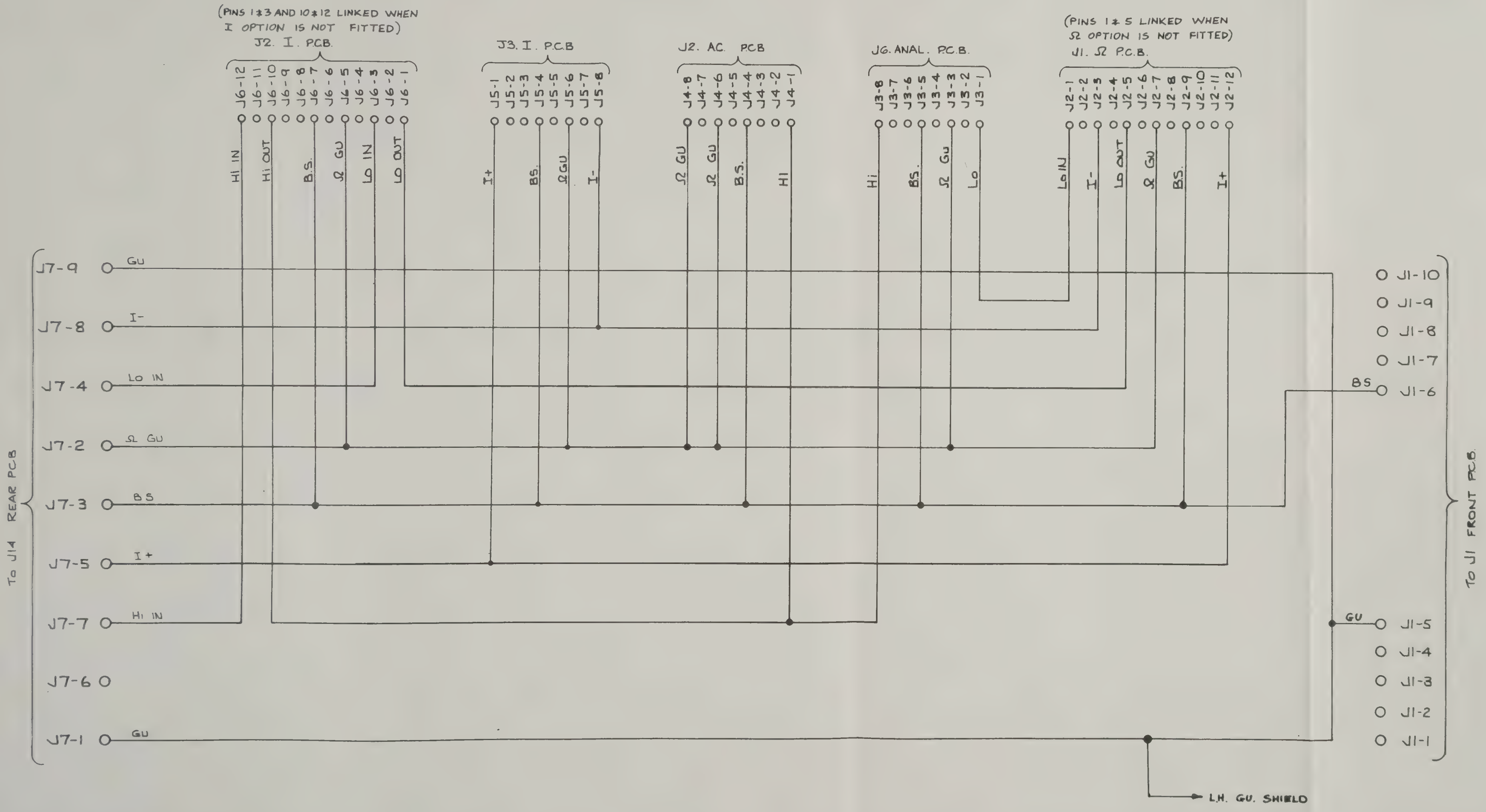
1/ ALL CIRCUIT TO BE ON THE COMPONENT (SHEET 3) SIDE OF P.C.B WHERE POSSIBLE.

2/ INPUT GUARD, VIA J7-1 TO PROVIDE ELECTROSTATIC SHIELD ON 'CIRCUIT' (SHEET 2) SIDE OF P.C.B. WHERE POSSIBLE.

3/ B.S, VIA J3-5, TO ENCLOSE Hi AND I+ CIRCUITS ON P.C.B WHERE POSSIBLE.

4/ Ω GUARD VIA J3-3 TO ENCLOSE LO & I- CIRCUITS ON P.C.B WHERE POSSIBLE.

ISS.	CHANGES
D	
1	RELEASED TO PROD 'N'. 29-9-78


(PINS 1 & 3 AND 10 & 12 LINKED WHEN I OPTION IS NOT FITTED)
J2. I. P.C.B.
J6-12 J6-11 J6-10 J6-9 J6-8 J6-7 J6-6 J6-5 J6-4 J6-3 J6-2 J6-1
HI IN
Hi OUT
B.S.
Ω GU
LO IN
LO OUT
J3. I. P.C.B
J5-1 J5-2 J5-3 J5-4 J5-5 J5-6 J5-7 J5-8
I+
BS.
Ω GU
I-
J2. AC. P.C.B
J4-8 J4-7 J4-6 J4-5 J4-4 J4-3 J4-2 J4-1
Ω GU
Ω GU
B.S.
HI
J6. ANAL. P.C.B.
J3-8 J3-7 J3-6 J3-5 J3-4 J3-3 J3-2 J3-1
Hi
BS.
Ω GU
LO
(PINS 1 & 5 LINKED WHEN Ω OPTION IS NOT FITTED)
J1. Ω P.C.B.
J2-1 J2-2 J2-3 J2-4 J2-5 J2-6 J2-7 J2-8 J2-9 J2-10 J2-11 J2-12
LO IN
I-
LO OUT
Ω GU
BS.
I+
J7-9 GU
J7-8 I-
J7-4 LO IN
J7-2 Ω GU
J7-3 BS
J7-5 I+
J7-7 Hi IN
J7-6
J7-1 GU
To J14 REAR PCB
J1-10
J1-9
J1-8
J1-7
BS J1-6
GU J1-5
J1-4
J1-3
J1-2
J1-1
To J1 FRONT PCB
L.H. GU. SHIELD

DRAWN
B.J.
CHECKED
TRACED
APPROVED
DATE
30.5.78
DATE

DIMENSIONS IN
MILLIMETRES
SCALE
NOT TO BE SCALED

TOLERANCES ANGULAR ± ½°
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± .005
DECIMAL TO 2 PLACES ± .010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED

MATERIAL

FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE
L.H. P.C.B. SCHEMATIC 1061/1071

DRAWING SIZE
A2

DRAWING No.
430297

SHEET
1 OF 1

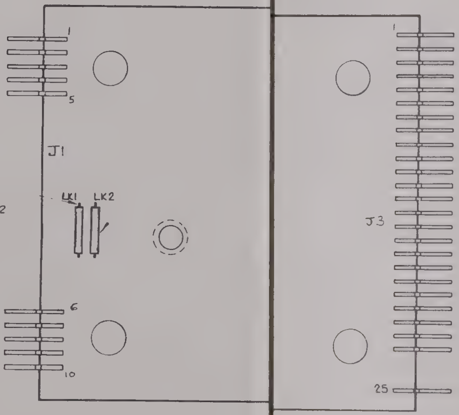
DRAWING No
400298
FIRST USED ON
1061/71

THIRD ANG
DRAWN IN ACCORDANCE

NOTES

ISS.	CHANGES
C	
D	NEW ISSUE P.C.B. B.J 24-8-78
1	RELEASED TO PROD'N' 29-9-78.
2	ECO 850. 4-5-79. B J UPDATED PCB J1-6 WAS REMOVED
3	ECO 867 & 904 BJ. UPDATED PCB CABLE ASSY 400365 CHANGED TO 574250/A
4	ECO. 943. 10.9 79 RIBBON CABLE ASSY. WAS 574250/A IL. BJ
5	ECO 1217 J2 WAS 400365 JR 18·8·81

LINKS USE 22SWG
TINNED CU WIRE.
DATRON PART No 540002



RIBBON CABLE ASSY
PART No 574270/c

NOTE. WHEN SOLDERING CABLE PLUG INTO BOARD ENSURE THAT THE PLUG BODY SITS FLAT AGAINST PCB.

AFTER ASSEMBLING P.C.B WRAP THE ABOVE RIBBON CABLE ROUND THE P.C.B AND TAPE DOWN USING MASKING TAPE PART No 630099.

IMPORTANT

AMP PINS (DA
MUST BE AFF
ENSURE ALL PINS
TO P.C.B. BEFORE

NOTE PINS ARE
THIS STRIP

FOR EXAMPLE. ABOV
THERE

ICS LTD. NORWICH.

ASSEMBLY.

DRAWING SIZE
A1

DRAWING No.
400298

SHEET
1 OF 2

DRAWING No.
430298

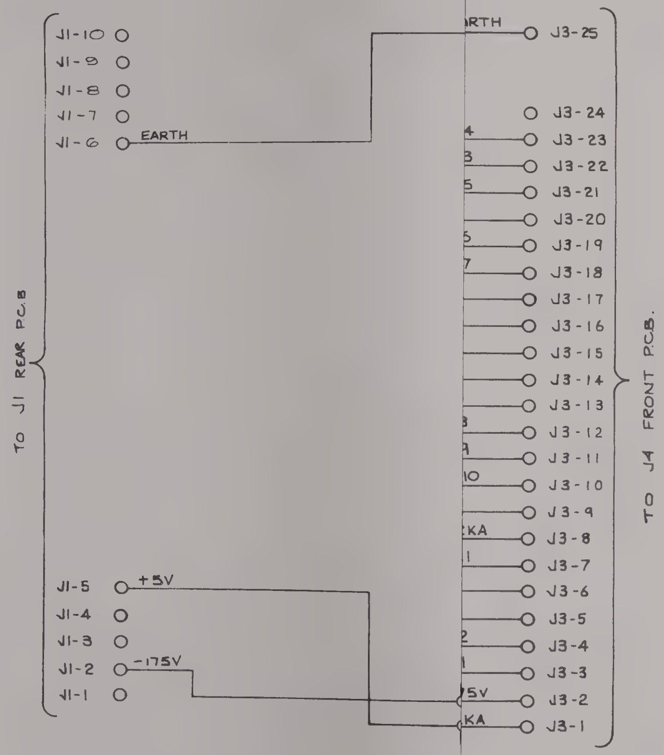
FIRST USED ON
1061 / 1071

THIRD ANGL

DRAWN IN ACCORDANCE W

NOTES

ISS.	CHANGES
D	
1^c	RELEASED TO PR 20-5-78
2	DIG COM SCREEN REMOVED. B.J. ECO 860 4-5-79


J1-10
J1-9
J1-8
J1-7
J1-6
EARTH
J1-5
+5V
J1-4
J1-3
J1-2
-175V
J1-1
TO J1 REAR P.C.B
RTH
J3-25
J3-24
4
J3-23
B
J3-22
5
J3-21
J3-20
5
J3-19
7
J3-18
J3-17
J3-16
J3-15
J3-14
J3-13
B
J3-12
A
J3-11
10
J3-10
J3-9
KA
J3-8
1
J3-7
J3-6
J3-5
2
J3-4
1
J3-3
5V
J3-2
KA
J3-1
TO J4 FRONT P.C.B.

DRAWN
B.J.

CHECKED

TRACED

APPROVED

DATE
26-5-78

DATE

DIMENSIONS IN

MILLIMETRES

SCALE

NOT TO BE SCALED

TOLERANCES
INCH DIMENSIONS
DECIMAL TO 3 PLACES ±
DECIMAL TO 2 PLACES ±
FRACTIONAL ±
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ±
DECIMAL TO 1 PLACE ±
WHOLE DIMENSIONS ±
UNLESS OTHERWISE STATED

CH.

DRAWING SIZE
A2

DRAWING No.
430298

SHEET
1 OF 1

DRAWING No.
400298
FIRST USED ON 1061/71

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

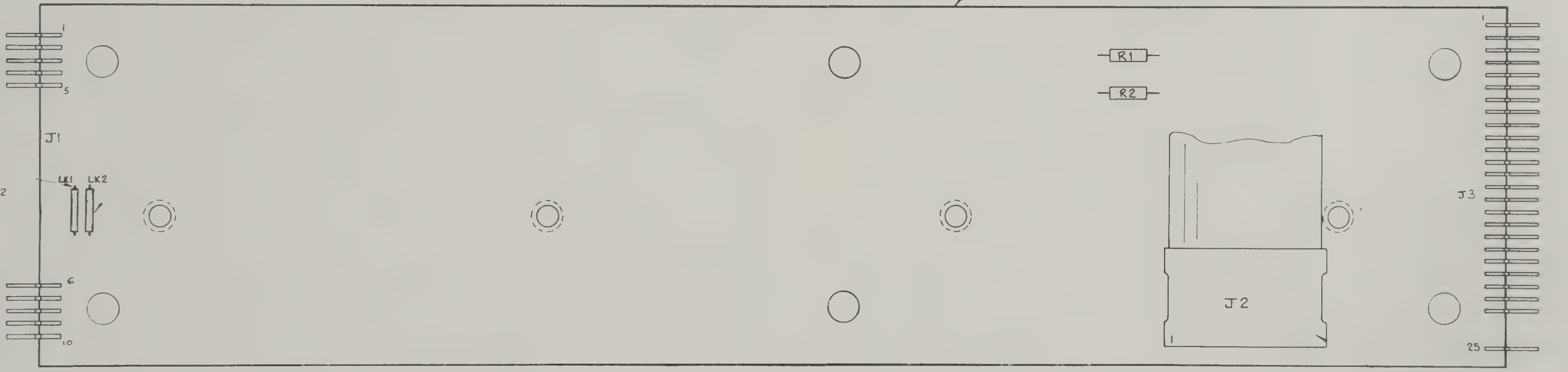
NOTES

ISS.	CHANGES	
C		
D	NEW ISSUE P.C.B BJ 24-8-78	MD
1	RELEASED TO PROD N 29-9-78	
2	ECO 850 4-5-79 UPDATED PCB B.J. J6 WAS REMOVED	MD
3	ECO 867 & 904 B.J. UPDATED PCB CABLE ASSY 400365 CHANGED TO 574250/A	MD
4	ECO 943 10 9 79 RIBBON CABLE ASSY WAS 574250/A IL	BJ
5	ECO 1217 J2 WAS 400365 JR 18 8 81	MD

LK1 & LK2 MUST BE COVERED WITH SLEEVE PART NO 590001.

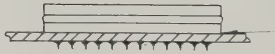
RIGHT HAND SIDE P.C.B 410094-4

LINKS USE 22SWG TINNED CU WIRE. DATRON PART No 540002



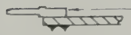
RIBBON CABLE ASSY
PART No 574270/C

NOTE. WHEN SOLDERING CABLE PLUG INTO BOARD ENSURE THAT THE PLUG BODY SITS FLAT AGAINST PCB.



AFTER ASSEMBLING P.C.B WRAP THE ABOVE RIBBON CABLE ROUND THE P.C.B AND TAPE DOWN USING MASKING TAPE PART No 630099

IMPORTANT



AMP PINS (DATRON PART No.604036.) 4 OFF MUST BE AFFIXED TO P.C.B FIRST.
ENSURE ALL PINS ARE SEATING TIGHTLY AND FLAT TO PCB BEFORE SOLDERING.

NOTE PINS ARE HELD TOGETHER BY PLASTIC STRIP.
THIS STRIP IS TO BE CUT TO SUIT THE AMOUNT OF PINS REQUIRED

FOR EXAMPLE. ABOVE 2 BLOCKS OF 5 PINS ARE REQUIRED, THEREFORE STRIP OF 10 PINS TO BE CUT IN HALF

DRAWN B.J.	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ° INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A1
TRACED	APPROVED	SCALE 2:1 NOT TO BE SCALED		FINISH	TITLE 1061/71. R.H. P.C.B. ASSEMBLY.	DRAWING No. 400298
DATE 20.4.78.	DATE					SHEET 1 OF 2

1 2 3 4 5 6

A B C D

DRAWING No.
430298
FIRST USED ON
1061 / 1071

THIRD ANGLE PROJECTION

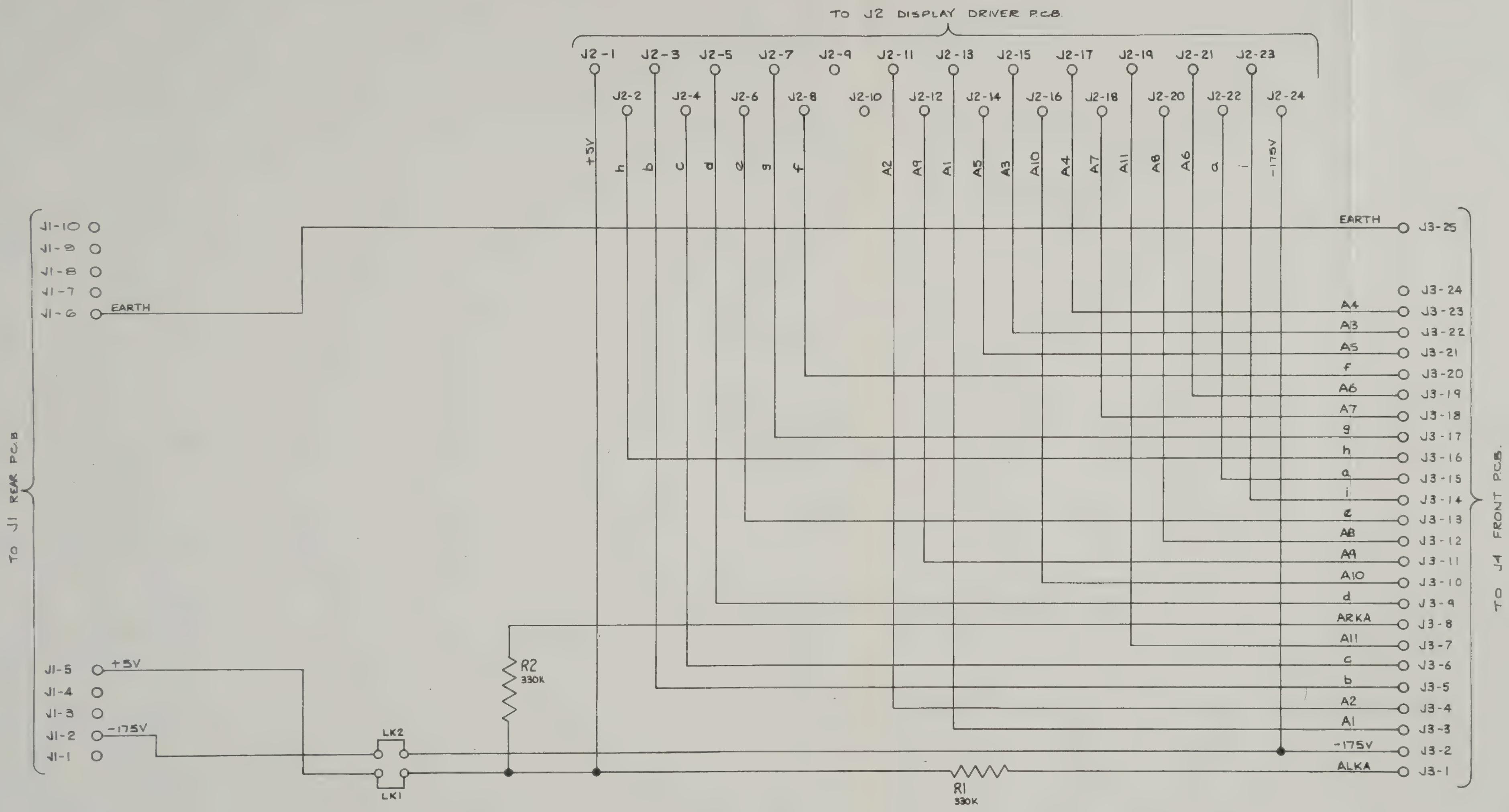
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
D	
1^c	RELEASED TO PRO 20-9-78
2	DIG COM SCREEN REMOVED B.J. ECO 860 9-8-79

KO


TO J2 DISPLAY DRIVER P.C.B.
J2-1
J2-3
J2-5
J2-7
J2-9
J2-11
J2-13
J2-15
J2-17
J2-19
J2-21
J2-23
J2-2
J2-4
J2-6
J2-8
J2-10
J2-12
J2-14
J2-16
J2-18
J2-20
J2-22
J2-24
+5V
h
b
c
d
e
g
f
A2
A9
A1
A5
A3
A10
A4
A7
A11
A8
A6
a
i
-175V
TO J1 REAR P.C.B.
J1-10
J1-9
J1-8
J1-7
J1-6
EARTH
J1-5
+5V
J1-4
J1-3
J1-2
-175V
J1-1
LK2
LK1
R2
330K
R1
330K
EARTH
J3-25
J3-24
A4
J3-23
A3
J3-22
A5
J3-21
f
J3-20
A6
J3-19
A7
J3-18
g
J3-17
h
J3-16
a
J3-15
i
J3-14
e
J3-13
A8
J3-12
A9
J3-11
A10
J3-10
d
J3-9
ARKA
J3-8
A11
J3-7
c
J3-6
b
J3-5
A2
J3-4
A1
J3-3
-175V
J3-2
ALKA
J3-1
TO J4 FRONT P.C.B.

DRAWN B.J.	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR + ½° INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ∓ 4mm UNLESS OTHERWISE STATED	MATERIAL
TRACED	APPROVED	SCALE NOT TO BE SCALED		FINISH
DATE 26-5-78	DATE			

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE
A2

TITLE
R.H. SIDE P.C.B. SCHEMATIC.

DRAWING No.
430298

SHEET
1 OF 1

DRAWING No
400304

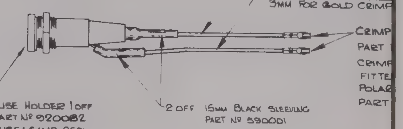
FIRST USED ON
1061/1071

THIRD ANG

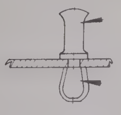
DRAWN IN ACCORDANCE

NOTES

CURRENT OPTION FUSE ASSEMBLY

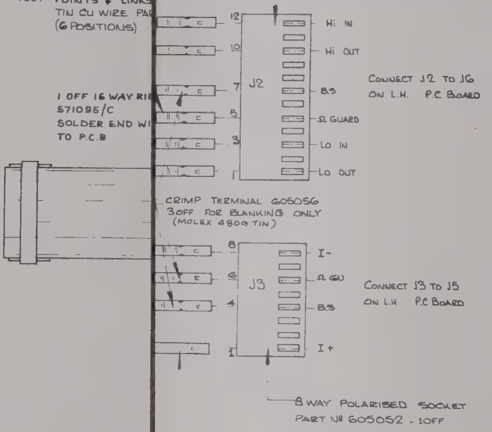

BROWN WIRE 60MM LON
3MM FOR GOLD CRIMP
BROWN WIRE 70MM LO
3MM FOR GOLD CRIMP
CRIMP
PART
CRIMP
FITTE
POLAR
PART
FUSE HOLDER 1 OFF
PART Nº 920082
FUSE 1·6AMP 250V
PART Nº 920071
2 OFF 15MM BLACK SLEEVING
PART Nº 590001

NYLATCH ASSEMBLY
(4 POSITIONS)


NYLATCH PLUNGER
PART Nº 617010 - 4 OFF
NYLATCH GROMMET
PART Nº 617011 - 4 OFF

N.B FIT FROM COMPONENT SIDE OF P C BOARD

SECTION A-A. TYPICAL


12 WAY POLARISED SOCKET
PART Nº 605053 1 OFF.
TEST POINTS & LINKS
TIN CU WIRE PA
(6 POSITIONS)
1 OFF 16 WAY RI
571095/C
SOLDER END WI
TO P.C.B
12
10
7
5
3
1
J2
Hi IN
Hi OUT
B.S
Ω GUARD
LO IN
LO OUT
CRIMP TERMINAL 605056
3 OFF FOR BLANKING ONLY
(MOLEX 4809 TIN)
8
6
4
1
J3
I-
Ω GU
B.S
I+
8 WAY POLARISED SOCKET
PART Nº 605052 - 1 OFF

CONNECT J2 TO J6 ON L.H. P.C BOARD

CONNECT J3 TO J5 ON L.H P.C BOARD

R27 + 28 ARE NOT USED W
OMRON ALTERNATIVES

FIT MOLEX TERMINALS
4809 GOLD PART Nº
605057 6-OFF
USING CRIMP TOOL
Nº HTR 2262A

ECTIONS
VED
ARTNº

-4
2

TO

ISS.	CHANGES
A	17 JULY 79 W.G.S
B	C1 POSITION CHANGED PCB WAS ISSUE 2 R2 & C4 VALUES CHANGED W.G.S 21·AUG 79.
C	STEATITE BEADS ADDED, TO MOUNT D13 - D16 24 OFF. IL 24.9.79
1	RELEASED TO PRODUCTION 24.9.79
2	ECO 972, 987 RL3 & RL4 WERE ITT. RELAY WIRING WAS P.V.C B.J 25-10-79.
3	ECO'S 1000, 1012, 1037 & 1038 RIBBON CABLE CLIP WAS 606007 CABLE WAS 571080/A FUSE HOLDER WAS 920047 C7 WAS 2n2F LK1 ADDED R8, R9, D9, D10, Q5 & Q6 DELETED. B.J. 4-1-80
4	ECO 1048 R26-R28 ADDED IL 17.1.80
5	ECO. 1099. 1110. 1087 J2-7 J3-4 & J3-6 WERE 605057 D17 & D18 REMOVED C8 ADDED IL 18.4.80
6	ECO. 1116 R29 ADDED CUT TRACK ON PCB BETWEEN M2/5 & J1-9 PARTS LIST CHANGE TO C8 IL 3.6.80
7	ECO 1189 OHMS GUARD LEAD WAS 400379/2 IL 17.12.80
8	ECO 1080 R 8, 9, C9, ADDED R 12 WAS 1K R 13, 7, WERE 12K R 5, 6, 14 WERE 27K R 26, 27, 28 WERE 10K R 17 WAS 1M Q1, Q3, AN1, LK1 DELETED JR 25.2.81
9	ECO 1217 J1 WAS 16 WAY SOCKET. JR 18·8·81

NICS LTD. NORWICH.

YOUT 1061/1071

DRAWING SIZE
A1

DRAWING No.
400304

SHEET
1 OF 7

1 2

DRAWING No
430 304

FIRST USED ON
1061/1071

THIRD ANGLE PRC
DRAWN IN ACCORDANCE WITH BS 308

NOTES

ISS.	CHANGES
A	18 JULY 79 W.G.S
B	R2 WAS 1MΩ - 000105 C4 WAS 10nF 250v CER DS 101103 W.G.S 21 AUG 79
1	RELEASED TO PRODUCTION. 24.9.79
2	ECO 1037 & 1038 SEE SHEET 2 B.J.
3	SEE SHEET 2 ECO 1048 IL 18.1.80
4	ECO 1087. 1110 C8 ADDED IL 14.4.80
5	ECO. 1116 R29 ADDED C8 WAS 1nF IL 3.6.80
6	ECO1080 R13 R14 Q1.Q3 +AN1 DELETED R5-7C4 MOVED C9 R17. R26-R28 ADDED JR 26 2.81

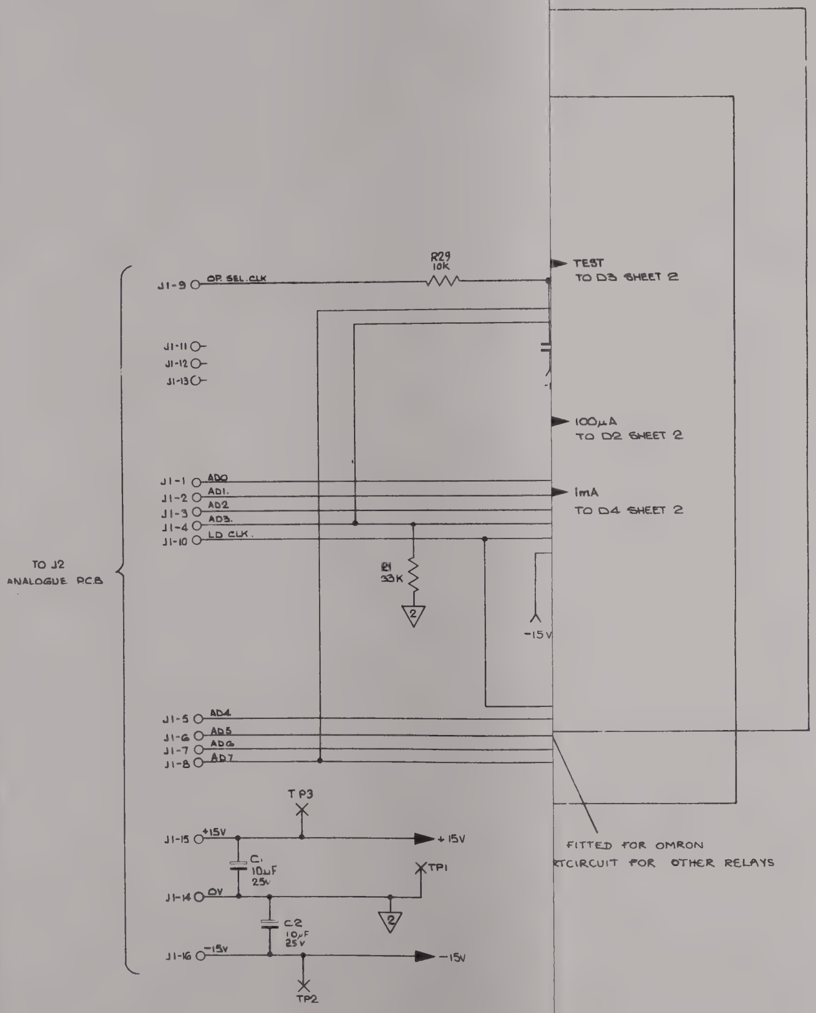
A

B

C

D

E



J1-9
OP. SEL.CLK
R29
10K
TEST
TO D3 SHEET 2
J1-11
J1-12
J1-13
100μA
TO D2 SHEET 2
J1-1 AD0
J1-2 AD1.
J1-3 AD2
J1-4 AD3.
J1-10 LD CLK.
ImA
TO D4 SHEET 2
R1
33K
2
-15V
TO J2
ANALOGUE PCB
J1-5 AD4
J1-6 AD5
J1-7 AD6
J1-8 AD7
TP3
J1-15 +15V
C1
10μF
25v
+15V
TP1
J1-14 0V
C2
10μF
25V
2
J1-16 -15V
-15V
TP2
FITTED FOR OMRON
TCIRCUIT FOR OTHER RELAYS

LTD. NORWICH

DRAWING SIZE
A1

RAM 1061-1071

DRAWING No	SHEET
430304	1 OF 2

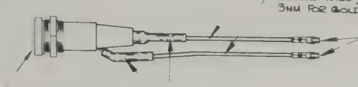
DRAWING No
400304
FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

CURRENT OPTION FUSE ASSEMBLY



BROWN WIRE 60MM LONG & ONE END STRIPPED 3MM FOR GOLD CRIMP PIN FITTING

BROWN WIRE 70MM LONG & ONE END STRIPPED 3MM FOR GOLD CRIMP PIN FITTING.

CRIMP TWO GOLD CRIMP PINS PART Nº G05057 - USING CRIMP TOOL Nº HTR 2262A FITTED INTO A 4 WAY POLARISED SOCKET (PINS 1 & 4) PART Nº G05051

FUSE HOLDER 1 OFF PART Nº 920082
FUSE 1·6AMP 250V PART Nº 920071

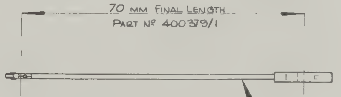
2 OFF 15MM BLACK SLEEVING PART Nº 590001

R25 NOTE

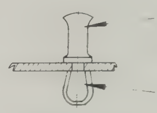
* IMPORTANT NOTE:

R25 RESISTOR TO BE FITTED LAST, SO THAT RL3 & RL4 WIRING TO P.C.B CAN BE DONE WITH EASE.

OHMS GUARD LEAD DETAIL


70 MM FINAL LENGTH
PART Nº 400379/1

NYLATCH ASSEMBLY
(4 POSITIONS)



NYLATCH PLUNGER PART Nº G17010 - 4 OFF
N.B FIT FROM COMPONENT SIDE OF P C BOARD

NYLATCH GROMMET PART Nº G17011 - 4 OFF

SECTION A-A. TYPICAL

MOUNT M1 M3 & M4 ON 16 WAY D.I.L SOCKETS PART Nº G05061 3 OFF

MOUNT M2 ON 14 WAY D.I.L SOCKET PART Nº G05060 1 OFF.

FOR DIFFERENT MAKES OF R19 C7 MUST BE CHANGED ACCORDINGLY SEE SHT 3 FOR FULL DETAILS.

RETAIN RELAY TO BRACKET WITH 3-48UNC NUT PART Nº G15005 & M2·5 WASHER PART Nº G13014 2 OFF EACH (2 POSITIONS)

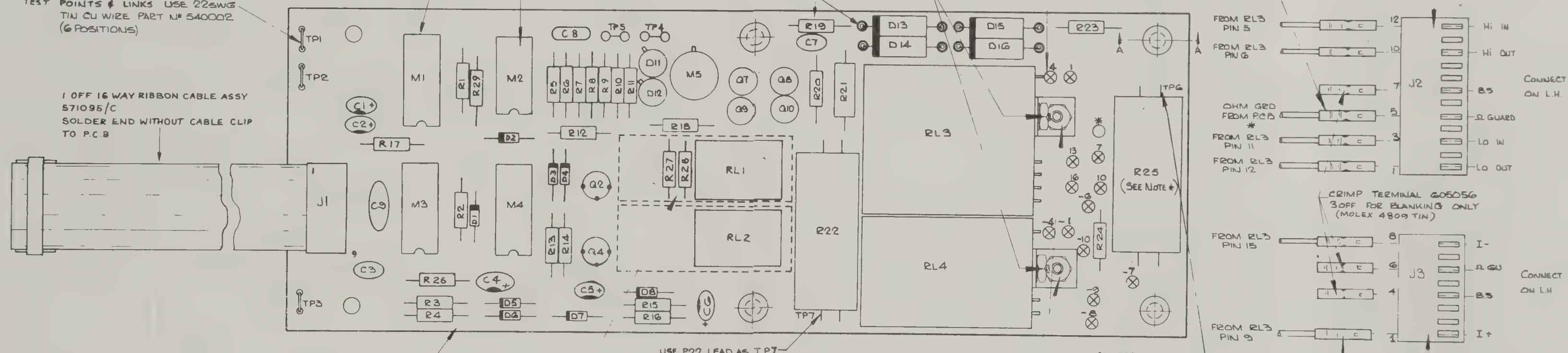
FIT D13–D16 ON STEATITE BEADS -3 PER LEAD. 630024, 24 OFF

13 OFF PCB TERMINALS PART Nº G20003

TEST POINTS & LINKS USE 22SWG TIN CU WIRE PART Nº 540002 (6 POSITIONS)

1 OFF 16 WAY RIBBON CABLE ASSY 571095/C SOLDER END WITHOUT CABLE CLIP TO P.C.B

12 WAY POLARISED SOCKET PART Nº G05053. 1 OFF.


TP1
TP2
TP3
TP4
TP5
TP6
TP7
J1
M1
M2
M3
M4
M5
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25 (SEE NOTE *)
R26
R27
R28
R29
C1+
C2+
C3
C4+
C5+
C7
C8
C9
D1
D2
D3
D4
D5
D6
D7
D8
D11
D12
D13
D14
D15
D16
Q2
Q4
Q7
Q8
Q9
Q10
RL1
RL2
RL3
RL4
A
A
FROM RL3 PIN 5
FROM RL3 PIN 6
OHM GRD FROM P.C.B *
FROM RL3 PIN 11
FROM RL3 PIN 12
FROM RL3 PIN 15
FROM RL3 PIN 9
J2
J3
12
10
7
5
3
1
8
6
4
1
Hi IN
Hi OUT
BS
Ω GUARD
LO IN
LO OUT
I-
Ω GU
BS
I+

CONNECT J2 TO J6 ON L.H. P C BOARD

CRIMP TERMINAL G05056 3 OFF FOR BLANKING ONLY (MOLEX 4809 TIN)

CONNECT J3 TO J5 ON L.H P.C BOARD

PRINTED CIRCUIT BOARD PART Nº 410104-5

USE R22 LEAD AS T P7

USE R25 LEAD AS TP6

8 WAY POLARISED SOCKET PART Nº G05052 - 1 OFF

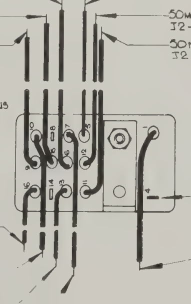
R27 + 28 ARE NOT USED WITH OMRON ALTERNATIVES

WIRING DETAILS RL3
ALL WIRES TO BE 7/·2 PTFE COVERED-WHITE PART Nº 540008. LENGTHS AS BELOW.

RETAIN RELAY BRACKETS TO P.C.B WITH 2 × M3 × 6 POSI PAN SCREWS PT Nº G11004 & 2 × M3 FULL NUT PT Nº G15002 & 2 × M3 SHAKEPROOF WASHERS PART Nº G13005

WIRING DETAILS RL4
ALL WIRES TO BE 7/·2 PTFE COVERED-WHITE PART Nº 540008. LENGTHS AS BELOW

FIT MOLEX TERMINALS 4809 GOLD PART Nº G05057 6 OFF USING CRIMP TOOL Nº HTR 2262A


10
8
7
3
9
15
6
12
16
14
13
11
1
4

55MM LONG FITTED TO J2-10.

50MM LONG FITTED TO J3-8.

60MM LONG FITTED TO J3-1

55MM LONG FITTED TO J2-12

50MM LONG FITTED TO J2-1

50MM LONG FITTED TO J2-3

N.B ALL WIRE CONNECTIONS TO RELAY SLEEVED 10MM LONG PART Nº 590001

FIT PIN 4 OVER P.C.B 4 TERMINAL & SOLDER IN POSITION.

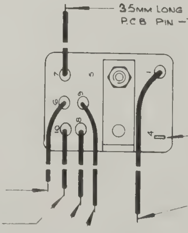
20MM LONG FITTED TO P.C.B PIN 16

32 MM LONG FITTED TO P.C.B PIN 10

20MM LONG FITTED TO P.C.B PIN 13.

30MM LONG FITTED TO P.C.B PIN 7

50MM LONG FITTED TO P.C.B. PIN 1



35MM LONG FITTED TO P.C.B PIN -7

N.B ALL WIRE CONNECTIONS TO RELAY SLEEVED 10MM LONG PART Nº 590001

FIT PIN 4 OVER PCB -4 TERMINAL & SOLDER IN POSITION

40MM LONG FITTED TO P.C.B PIN -6

30MM LONG FITTED TO P.C.B PIN -10

25MM LONG FITTED TO P.C.B PIN -8

25MM LONG FITTED TO P.C.B PIN -9

30MM LONG FITTED TO PCB PIN -1

	CHANGES
A	17 JULY 79 W.G.S
B	C1 POSITION CHANGED PCB WAS ISSUE 2 R2 & C4 VALUES CHANGED W.G.S 21·AUG 79
C	STEATITE BEADS ADDED, TO MOUNT D13 – D16 24 OFF IL 24.9.79
1	RELEASED TO PRODUCTION 24.9.79
2	ECO 972, 987 RL3 & RL4 WERE ITT RELAY WIRING WAS P.V.C B.J 25-10-79
3	ECO'S 1000, 1012, 1037 & 1038 RIBBON CABLE CLIP WAS G06007 CABLE WAS 571080/A FUSE HOLDER WAS 920047 C7 WAS 2n2F LK1 ADDED R8, R9, D9, D10, Q5 & Q6 DELETED B.J 4-1-80
4	ECO 1048 R26-R28 ADDED IL 17 1 80
5	ECO. 1099. 1110. 1087 J2-7 J3-4 + J3-6 WERE G05057 D17 + D18 REMOVED C8 ADDED IL 18 4 80
6	ECO 1116 R29 ADDED CUT TRACK ON PCB BETWEEN M2/5 + J1-9 PARTS LIST CHANGE TO C8 IL 3.6.80
7	ECO 1189 OHMS GUARD LEAD WAS 400379/2 IL 17 12 80
8	ECO 080 R 8 9 C9. ADDED R 12 WAS 1K R 13, 7 WERE .2K R 5 6 14 WERE 27K R 26. 27. 28 WERE 10K R 17 WAS 1M Q1, Q3, AN1, LK1 DELETED JR 25. 2. 81
9	ECO 1217 J1 WAS 16 WAY SOCKET JR 18 8 81

DRAWN W.G SMITH
CHECKED
TRACED
APPROVED
DATE 16 JULY 79
DATE
DIMENSIONS IN MILLIMETRES
SCALE
NOT TO BE SCALED
TOLERANCES ANGULAR ± °
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± 005
DECIMAL TO 2 PLACES ± 010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED
MATERIAL
FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE
CURRENT P.C. BOARD LAYOUT 1061/1071

DRAWING SIZE A1
DRAWING No. 400304
SHEET 1 OF 7

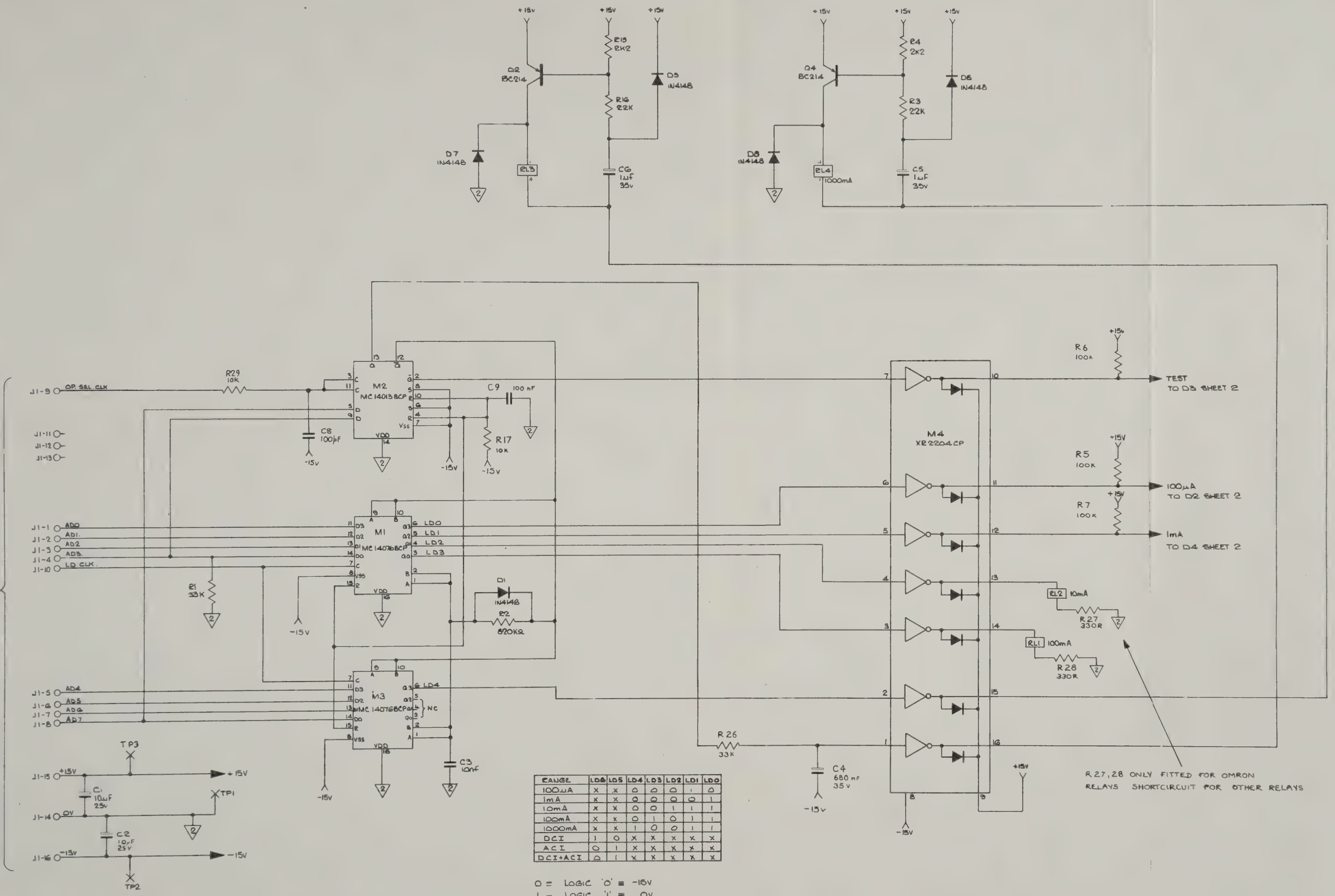
DRAWING No
430 304
FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

NOTES

ISS	CHANGES
A	18 JULY 79 W.G.S
B	R2 WAS 1MΩ - 000105 C4 WAS 10nF 250V CER DG 101103 W G S 21 AUG 79
1	RELEASED TO PRODUCTION 24 9 79
2	ECO 1037 & 1038 SEE SHEET 2
3	SEE SHEET 2 ECO 1048 18.1.80
4	ECO 1087. 1110 C8 ADDED 14.4 80
5	ECO. 1116 R29 ADDED C8 WAS 1nF 3.6 80
6	ECO 1080 R13.R14 Q1.Q3 +AN1 DELETED R5-7 C4 MOVED C9 R17. R26-R28 ADDED JR 26 2 81



+15V
R15 2K2
Q2 BC214
D3 IN4148
R16 22K
D7 IN4148
RL3
C6 1µF 35V
Q4 BC214
R4 2K2
D5 IN4148
R3 22K
D8 IN4148
RL4 1000mA
C5 1µF 35V
J1-9 OP. SEL CLK
R29 10K
C8 100pF
-15V
M2 MC 14013BCP
C9 100nF
R17 10K
J1-11
J1-12
J1-13
J1-1 AD0
J1-2 AD1
J1-3 AD2
J1-4 AD3
J1-10 LD CLK
TO J2 ANALOGUE PCB
M1 MC 14076BCP
LD0
LD1
LD2
LD3
R1 33K
D1 IN4148
R2 820KΩ
J1-5 AD4
J1-6 AD5
J1-7 AD6
J1-8 AD7
M3 MC 14076BCP
LD4
NC
C3 10nF
R26 33K
C4 680nF 35V
M4 XR2204CP
R6 100K
TEST TO D3 SHEET 2
R5 100K
100µA TO D2 SHEET 2
R7 100K
1mA TO D4 SHEET 2
RL2 10mA
R27 330R
RL1 100mA
R28 330R
J1-15 +15V
TP3
C1 10µF 25V
TP1
J1-14 0V
C2 10µF 25V
J1-16 -15V
TP2

R 27, 28 ONLY FITTED FOR OMRON RELAYS SHORTCIRCUIT FOR OTHER RELAYS

RANGE	LD6	LD5	LD4	LD3	LD2	LD1	LD0
100µA	X	X	0	0	0	1	0
1mA	X	X	0	0	0	0	1
10mA	X	X	0	0	1	1	1
100mA	X	X	0	1	0	1	1
1000mA	X	X	1	0	0	1	1
DCI	1	0	X	X	X	X	X
ACI	0	1	X	X	X	X	X
DCI+ACI	0	1	X	X	X	X	X

0 = LOGIC '0' ≡ -15V
1 = LOGIC '1' ≡ 0V
X = DONT CARE CONDITION

W G SMITH
20 JULY 79
NOT TO BE SCALED

TOLERANCES
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± .005
DECIMAL TO 2 PLACES ± .010
FRACTIONAL 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS 4mm
UNLESS OTHERWISE STATED
ANGULAR °

MATERIAL

FINISH

datron ELECTRONICS LTD. NORWICH

TITLE
CURRENT P.C. BOARD CIRCUIT DIAGRAM 1061-1071

DRAWING SIZE
A1

DRAWING No
430304

SHEET
1 OF 2

DRAWING No	430304
FIRST USED ON	1061/1071

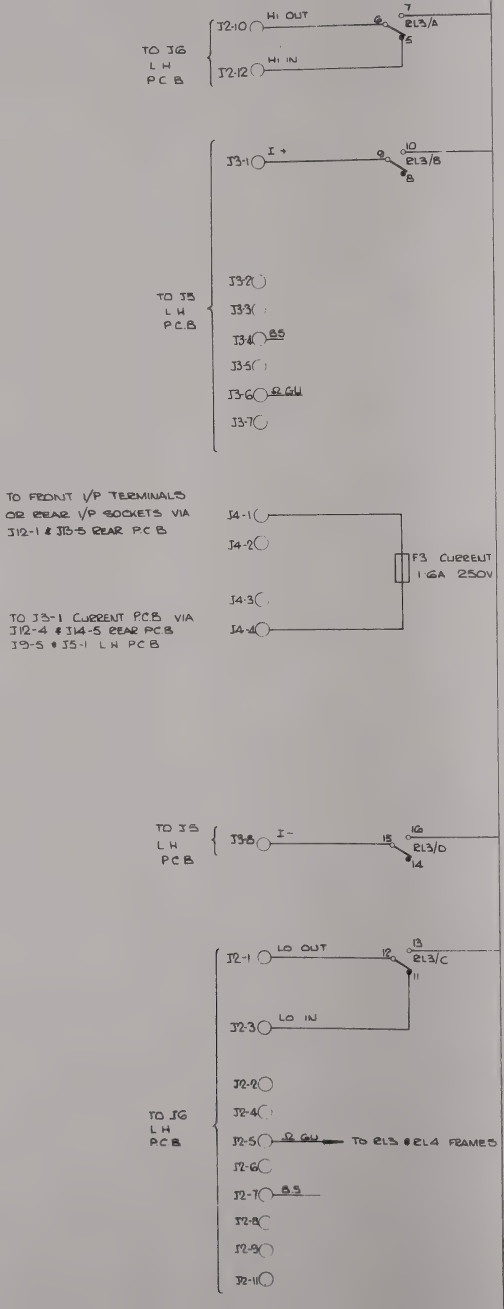
THIRD ANGLE PR

DRAWN IN ACCORDANCE WITH BS 308

NOTES

1 470pF IF R19 MANUFACTURED BY MANN COMP
330pF KELVIN

ISS	CHANGES
A	18 JULY 79 W.G.S
B	SEE SHT 1
1	RELEASED TO PRODUCTION 24.9.79
2	ECO. 1037 & 1038 C7 WAS 2n2F R8, R9, D9, D10, Q5, & Q6 DELETED B.J. 4-1-80.
3	ECO. 1048 R26-R28 ADDED IL 18.1.80
4	ECO. 1087 D17 D18 REMOVED IL 14.4.80
5	SEE SHEET 1
6	ECO 1080 R12-14 TRACKED IN TO P.C.B DESIGNATORS REDEFINED. JR 26.2.81


TO J6 LH PCB
J2-10
HI OUT
6
7
RL3/A
5
J2-12
HI IN
J3-1
I +
9
10
RL3/B
8
TO J5 LH PC.B
J3-2
J3-3
J3-4
BS
J3-5
J3-6
R GU
J3-7
TO FRONT I/P TERMINALS OR REAR I/P SOCKETS VIA J12-1 & J13-5 REAR PCB
J4-1
J4-2
F3 CURRENT 1.6A 250V
J4-3
TO J3-1 CURRENT PCB VIA J12-4 & J14-5 REAR PCB J9-5 & J5-1 LH PCB
J4-4
TO J5 LH PCB
J3-8
I -
15
16
RL3/D
14
J2-1
LO OUT
12
13
RL3/C
11
J2-3
LO IN
TO J6 LH PCB
J2-2
J2-4
J2-5
R GU
TO RL3 & RL4 FRAMES
J2-6
J2-7
BS
J2-8
J2-9
J2-11

S LTD NORWICH

DIAGRAM - 1061-1071

DRAWING SIZE	
A1	
DRAWING No	SHEET
430304	2 OF 2

DRAWING No
430304
FIRST USED ON
1061/1071

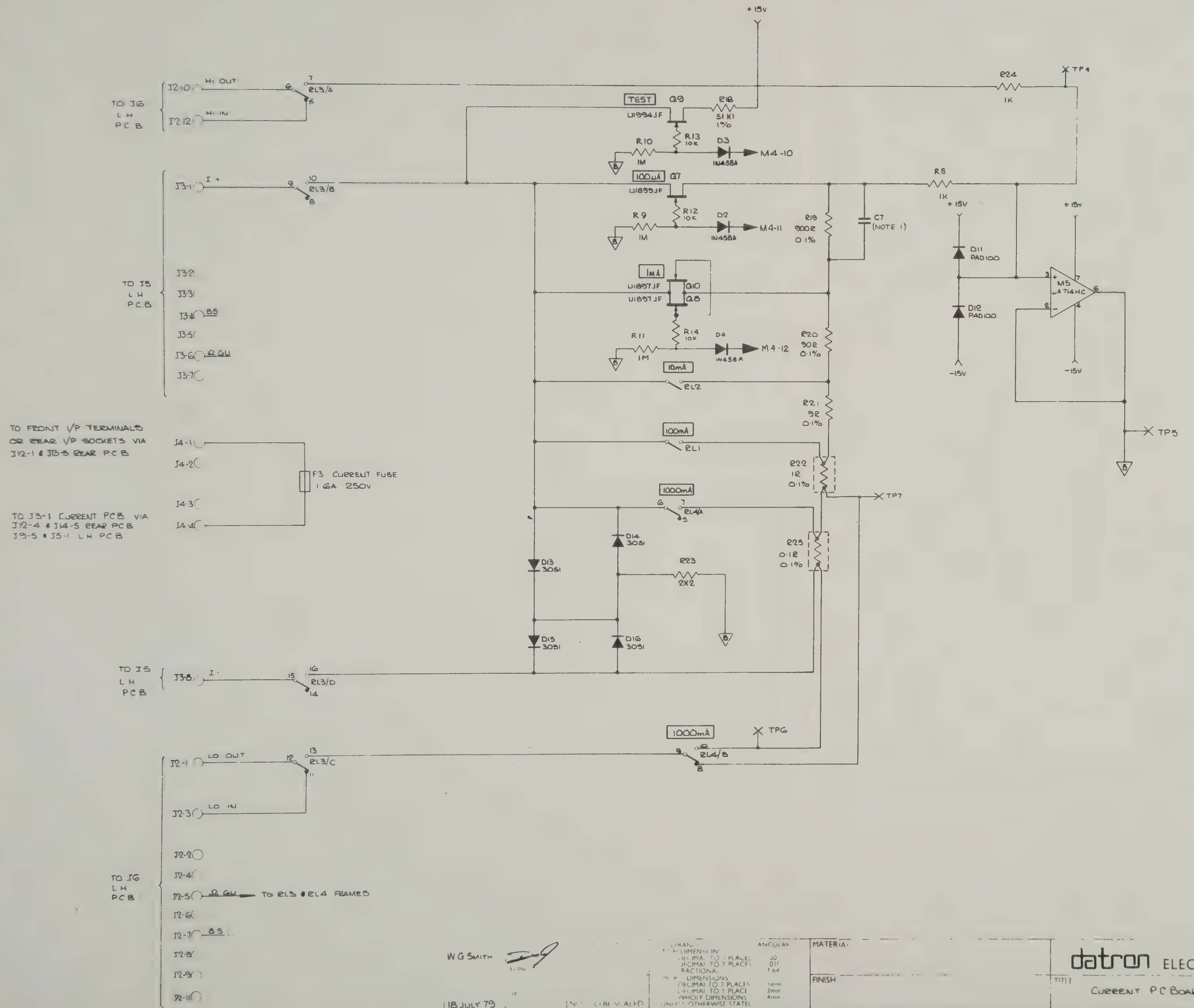
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

NOTES

1 470pF IF R19 MANUFACTURED BY MANN COMP
330pF KELVIN

	CHANGES
A	18 JULY 79 W.G.S
8	SEE SHT 1
1	RELEASED TO PRODUCTION 24 9 79
2	ECO. 1037 & 1038 C7 WAS 2n2F R8, R9, D9, D10, Q5, & Q6 DELETED B J 4-1-80
3	ECO. 1048 R26-R28 ADDED 18.1.80
4	ECO. 1087 D17 D18 REMOVED 14.4.80
5	SEE SHEET 1
6	ECO 1080 R12-14 TRACKED IN TO PC B DESIGNATORS REDEFINED. JR 26.2.81



+15V
J2-10 HI OUT
J2-12 HI IN
TO J6 LH PCB
RL3/A
R24 1K
TP4
TEST Q9 U1994JF
R18 51K1 1%
R13 10K
R10 1M
D3 1N458A
M4-10
100µA Q7 U1899JF
J3-1 I+
RL3/B
R12 10K
R9 1M
D2 1N458A
M4-11
R19 900Ω 0.1%
C7 (NOTE 1)
R8 1K
TO J5 LH PCB
J3-2
J3-3
J3-4 BS
J3-5
J3-6 R GN
J3-7
1mA
U1897JF Q10
U1897JF Q8
R14 10K
R11 1M
D4 1N458A
M4-12
R20 90Ω 0.1%
10mA
RL2
R21 9Ω 0.1%
100mA
RL1
D11 PAD100
D12 PAD100
M5 µA714HC
+15V
-15V
TP5
TO FRONT I/P TERMINALS OR REAR I/P SOCKETS VIA J12-1 & J13-5 REAR PCB
J4-1
J4-2
J4-3
J4-4
F3 CURRENT FUSE 1.6A 250V
TO J3-1 CURRENT PCB VIA J12-4 & J14-5 REAR PCB J9-5 & J5-1 LH PCB
R22 1Ω 0.1%
TP7
1000mA
RL4/A
D14 3081
D13 3081
R23 2K2
R25 0.1Ω 0.1%
D15 3081
D16 3081
TO J5 LH PCB
J3-8 I-
RL3/D
1000mA
TP6
J2-1 LO OUT
RL3/C
RL4/B
J2-3 LO IN
TO J6 LH PCB
J2-2
J2-4
J2-5 R GN TO RL3 & RL4 FRAMES
J2-6
J2-7 BS
J2-8
J2-9
J2-11

W G SMITH
18 JULY 79

TOLERANCES
DIMENSIONS
DECIMAL TO 3 PLACES .00
DECIMAL TO 2 PLACES .01
FRACTIONAL 1/64
DIMENSIONS
DECIMAL TO 2 PLACES 1mm
DECIMAL TO 1 PLACE 2mm
WHOLE DIMENSIONS 4mm
UNLESS OTHERWISE STATED
ANGULAR
NOT TO BE SCALED

MATERIAL
FINISH

datron ELECTRONICS LTD NORWICH

TITLE
CURRENT PC BOARD CIRCUIT DIAGRAM - 1061-1071

DRAWING SIZE
A1
DRAWING No
430304
SHEET
2 OF 2

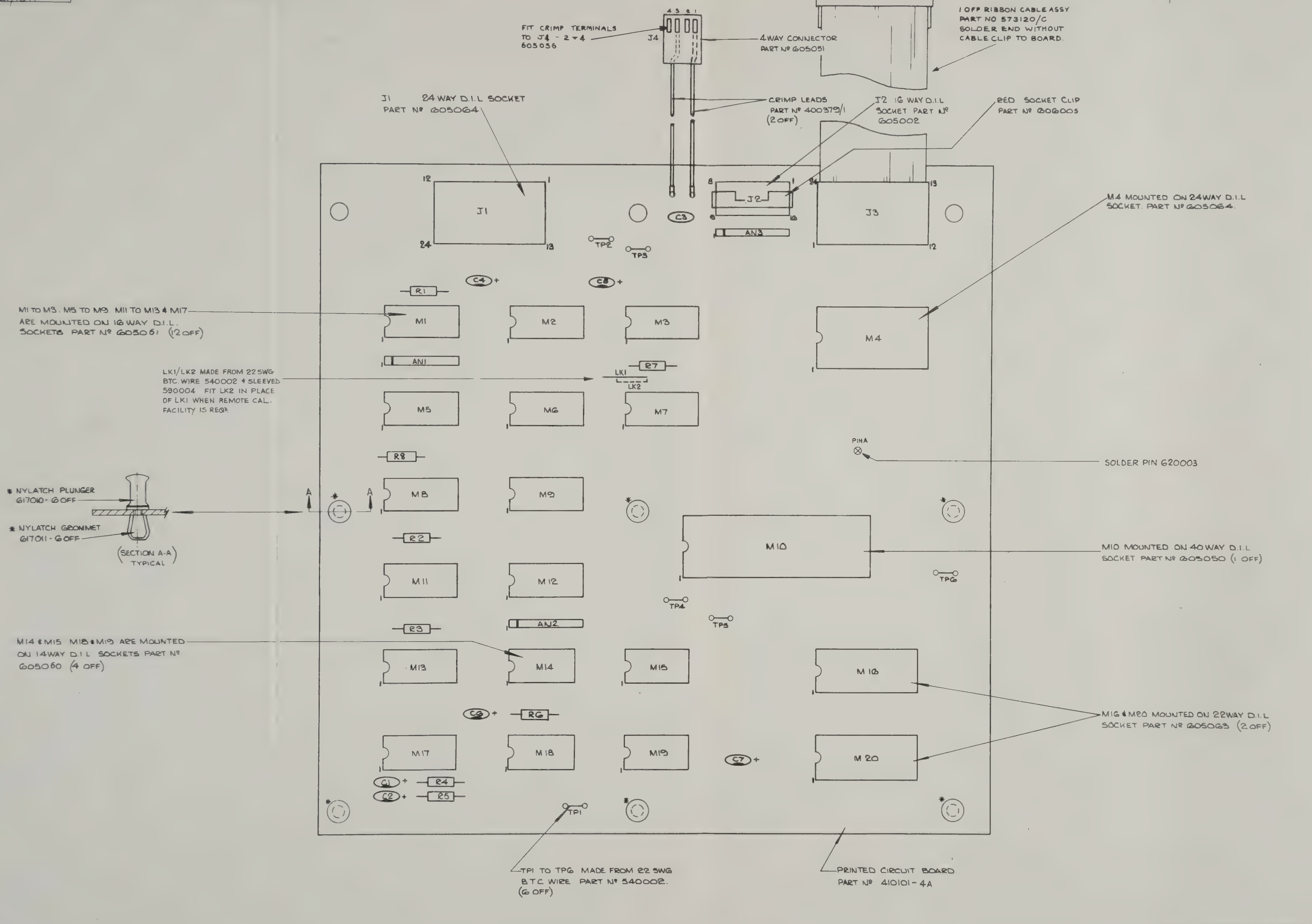
DRAWING No
400306
FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
1	RELEASED TO PRODUCTION 18 MAY 79 WGS
2	ECO 1008 26-10-79 RB ADDED 8.1
3	ECO 1000 1052 SOCKET CLIP FOR J2 WAS 606007 PIN A & LK1/LK2 ADDED IL 18.1 80
4	ECO 1178 PCB WAS ISSUE 4 IL 14 10 80
5	ECO 1198 605056 CRIMPS ADDED TO J4 JR 25 2 81
6	ECO 1217 J3 WAS 24 WAY SOCKET. JR 18 8 81



FIT CRIMP TERMINALS TO J4 - 2 & 4 605056

4WAY CONNECTOR PART Nº 605051

1 OFF RIBBON CABLE ASSY PART NO 573120/C SOLDER END WITHOUT CABLE CLIP TO BOARD.

J1 24 WAY D.I.L SOCKET PART Nº 605064

CRIMP LEADS PART Nº 400379/1 (2 OFF)

J2 16 WAY D.I.L SOCKET PART Nº 605002

RED SOCKET CLIP PART Nº 606005

M4 MOUNTED ON 24WAY D.I.L SOCKET. PART Nº 605064.

M1 TO M3. M5 TO M9. M11 TO M13 & M17 ARE MOUNTED ON 16 WAY D.I.L. SOCKETS PART Nº 605061 (12 OFF)

LK1/LK2 MADE FROM 22 SWG BTC. WIRE 540002 & SLEEVED 590004 FIT LK2 IN PLACE OF LK1 WHEN REMOTE CAL. FACILITY IS REQD.

SOLDER PIN 620003

* NYLATCH PLUNGER 617010 - 6 OFF

* NYLATCH GROMMET 617011 - 6 OFF

(SECTION A-A TYPICAL)

M10 MOUNTED ON 40 WAY D.I.L SOCKET PART Nº 605050 (1 OFF)

M14 & M15 M18 & M19 ARE MOUNTED ON 14 WAY D.I.L SOCKETS PART Nº 605060 (4 OFF)

M16 & M20 MOUNTED ON 22 WAY D.I.L SOCKET PART Nº 605063 (2 OFF)

TP1 TO TP6 MADE FROM 22 SWG BTC WIRE PART Nº 540002. (6 OFF)

PRINTED CIRCUIT BOARD PART Nº 410101 - 4A

CIRCUIT DIAGRAM = 430306-3

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	MATERIAL
W.G SMITH.	B.C.H.	MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED ANGULAR ± °	
TRACED	APPROVED	SCALE		FINISH
DATE 24th APRIL 79	DATE 18 MAY 79	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

TITLE
I.E.E.E 488 OPTION P.C.B ASSEMBLY 1071 1061

DRAWING SIZE
A1

DRAWING No
400306

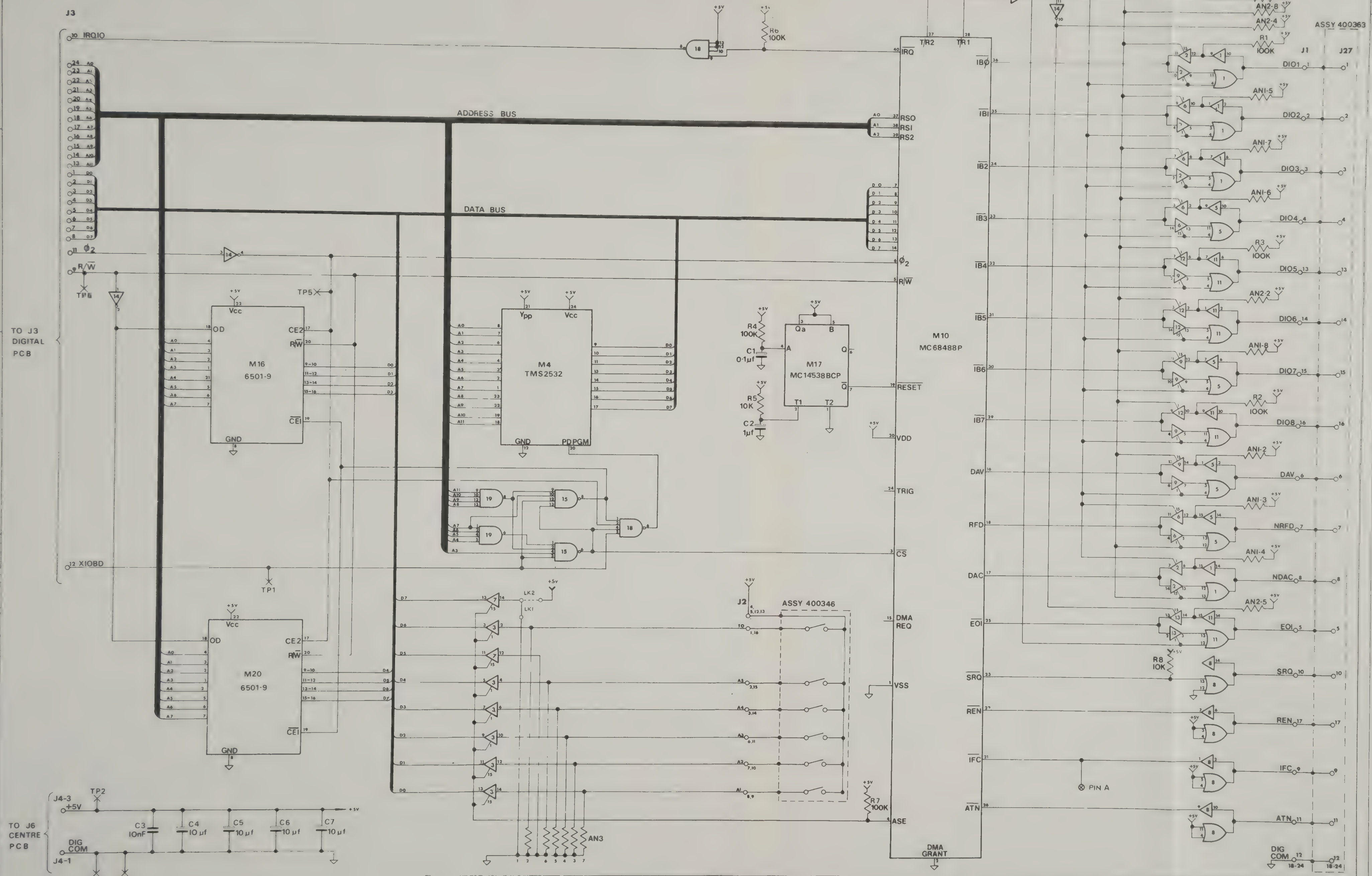
SHEET
OF

DRAWING No	430306
FIRST USED ON	106/107I

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ISS	CHANGES
1	RELEASED TO PRODUCTIO 18 MAY 79. W.G.S
2	ECO 1006 26-10- R8 ADDED B
3	ECO.1052 PIN A + LK1/LK2 ADDED 18 1 80


J3
IRQ10
ADDRESS BUS
DATA BUS
φ2
R/W
TP6
TP5
TO J3 DIGITAL PCB
M16 6501-9
M4 TMS2532
M20 6501-9
Vcc
Vpp
GND
OD
CE2
CE1
PD PGM
X10BD
TP1
R6 100K
R4 100K
C1 0·1μf
R5 10K
C2 1μf
M17 MC14538BCP
Qa
B
A
Q
T1
T2
M10 MC68488P
IRQ
T/R2
T/R1
RS0
RS1
RS2
RESET
VDD
TRIG
CS
DMA REQ
VSS
ASE
DMA GRANT
IB0
IB1
IB2
IB3
IB4
IB5
IB6
IB7
DAV
RFD
DAC
EOI
SRQ
REN
IFC
ATN
LK1
LK2
J2
ASSY 400346
R7 100K
AN3
R8 10K
PIN A
ASSY 400363
J1
J27
R1 100K
R2 100K
R3 100K
AN2-6
AN2-3
AN2-8
AN2-4
AN1-5
AN1-7
AN1-6
AN2-2
AN1-8
AN1-2
AN1-3
AN1-4
AN2-5
DIO1
DIO2
DIO3
DIO4
DIO5
DIO6
DIO7
DIO8
DAV
NRFD
NDAC
EOI
SRQ
REN
IFC
ATN
DIG COM
J4-3
+5V
TP2
C3 10nF
C4 10μf
C5 10μf
C6 10μf
C7 10μf
TO J6 CENTRE PCB
DIG COM
J4-1
TP3
TP4

DRAWN W G SMITH.	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ° INCH DIMENSIONS DECIMAL TO 3 PLACES ± ·005 DECIMAL TO 2 PLACES ± ·010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A1
TRACED	APPROVED	SCALE		FINISH	TITLE IEEE 488 OPTION CIRCUIT DIAGRAM	DRAWING No 430306
DATE 25th APRIL 79	DATE 18 MAY 79.	NOT TO BE SCALED				SHEET 1 OF 2

1 2 6

DRAWING No.
430306

FIRST USED ON
1061/1071

THIRD ANGL

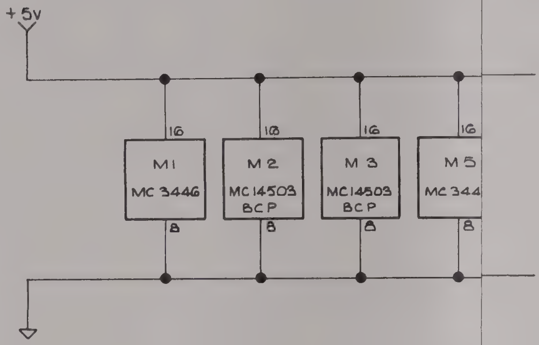
DRAWN IN ACCORDANCE WI

NOTES

ISS.	CHANGES
A	FIRST ISSUE 9 MAY 79 W.G.S.
1	RELEASED TO PRODUCTION 18·MAY 79. W.G.S.
2	ECO 1008 B.J. RB ADDED 26·10·79
3	SEE SHEET 1

A

B


+5v
16
16
16
16
M1
MC 3446
M2
MC14503
BCP
M3
MC14503
BCP
M5
MC 344
8
8
8
8

C

D

DRAWN W.G.SMITH.	CHECKED S.C.M.	DIMENSIONS IN MILLIMETRES	TOLERANCES AN INCH DIMENSIONS DECIMAL TO 3 PLACES ± DECIMAL TO 2 PLACES ± FRACTIONAL ± METRIC DIMENSIONS DECIMAL TO 2 PLACES ± DECIMAL TO 1 PLACE ± WHOLE DIMENSIONS ± UNLESS OTHERWISE STATED
TRACED	APPROVED	SCALE NOT TO BE SCALED	
DATE 25 APRIL 79.	DATE 18 MAY 79.		

WICH.

DRAWING SIZE
A2

DRAWING No.
430306

SHEET
2 OF 2

DRAWING No.
430306

FIRST USED ON
1061/1071

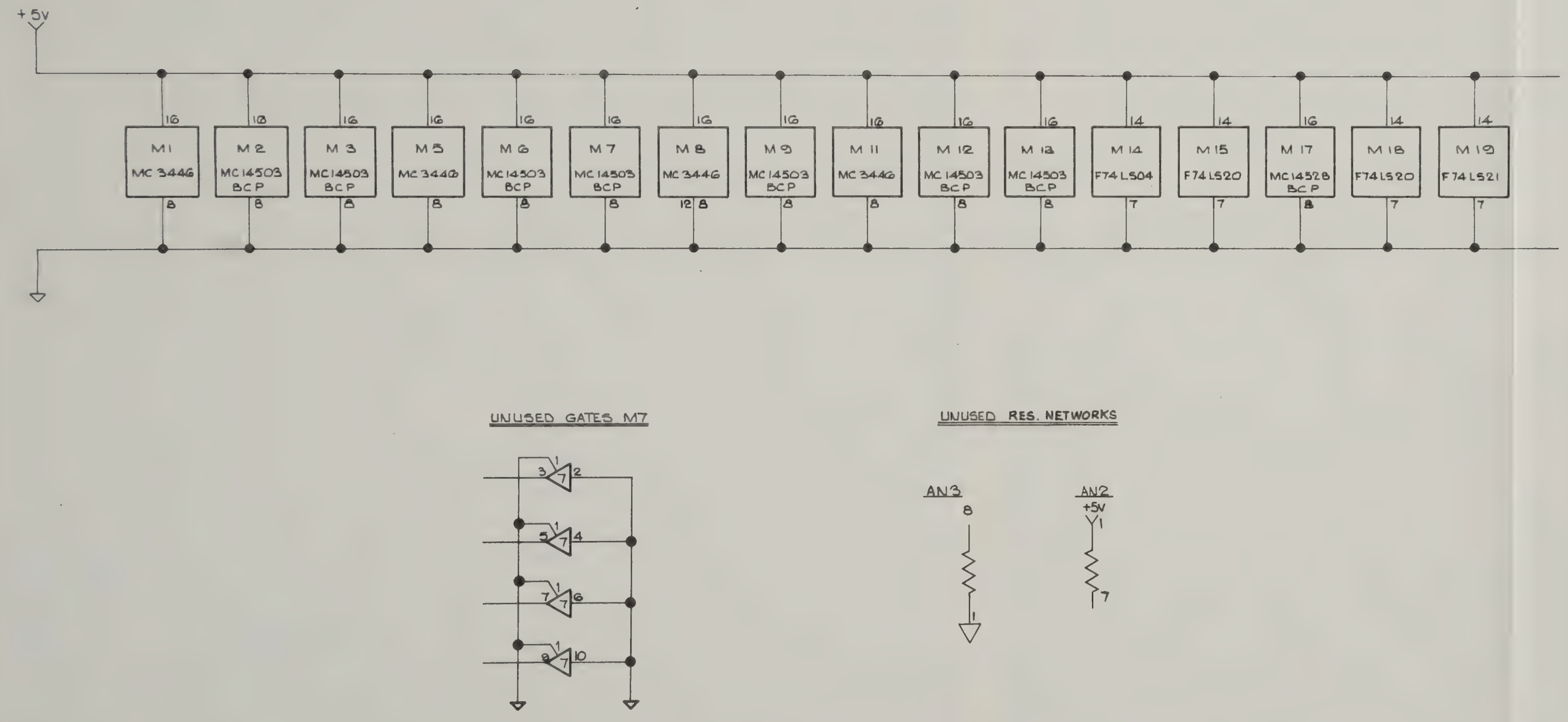
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
A	FIRST ISSUE 9 MAY 79 W.G.S.
1	RELEASED TO PRODUCTION 18 MAY 79. W.G.S.
2	ECO 1008 B.J. RB ADDED 26·10·79
3	SEE SHEET 1



+5v
16
M1
MC 3446
8
16
M2
MC14503 BCP
8
16
M3
MC14503 BCP
8
16
M5
MC 3446
8
16
M6
MC14503 BCP
8
16
M7
MC14503 BCP
8
16
M8
MC 3446
12 8
16
M9
MC 14503 BCP
8
16
M11
MC 3446
8
16
M12
MC 14503 BCP
8
16
M13
MC 14503 BCP
8
14
M14
F74LS04
7
14
M15
F74LS20
7
16
M17
MC14528 BCP
8
14
M18
F74LS20
7
14
M19
F74LS21
7
UNUSED GATES M7
3
2
5
4
7
6
9
10
1
7
UNUSED RES. NETWORKS
AN3
8
1
AN2
+5v
1
7

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES ANGULAR + ½°
W.G.SMITH.	S.C.M.	MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± ·005 DECIMAL TO 2 PLACES ± ·010 FRACTIONAL ± 1/64
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm
DATE 25 APRIL 79.	DATE 18 MAY 79.	NOT TO BE SCALED	UNLESS OTHERWISE STATED

MATERIAL

FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE
I.EEE 488 OPTION CIRCUIT DIAGRAM

DRAWING SIZE
A2

DRAWING No.
430306

SHEET
2 OF 2

DRAWING No.	400307
FIRST USED ON	1061/1071

THIRD ANGL
DRAWN IN ACCORDANCE V

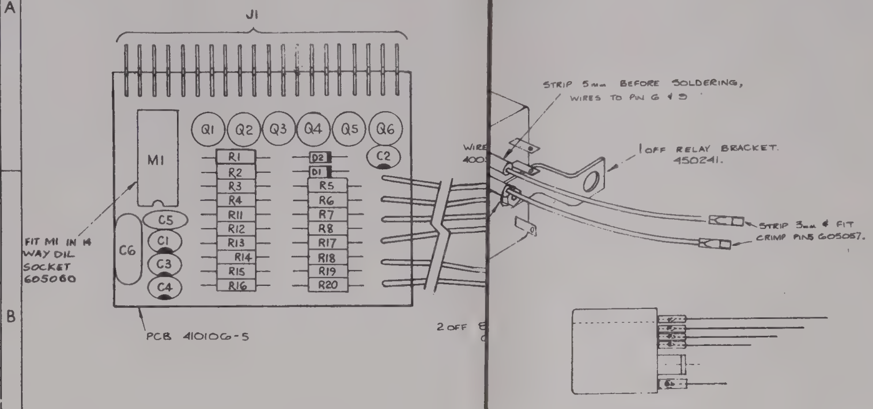
NOTES

IMPORTANT.

FOR CRIMP PINS USE TOOL Nº HTR2262A.

ISS	CHANGES
A	
1	RELEASED 26-3-75
2	LK1 REPLACED BY R10 (000100). D6 DELETED E.C.O. 902/887 5 JUNE 79 W.G.S.
3	ECO. 972. 25-10-79 RL1, RL2, RL3 & RL4. WERE ITT. B.J.
4	ECO 981. 6-11-79. B.J. R9 WAS 33K. R10 WAS 10Ω R11 & R12 ADDED. D7 ADDED. D5 DELETED 400379/4 1off ADDED. PCB'S UP-DATED.
5	ECO 1021, 1034. R12 MOVED & WAS 33K NOW 1M. LK1 ADDED. D7 & R10 DELETED R9 WAS 18K. B.J. 2-1-80.
6	ECO 1085 POLARISING KEY FOR J3 REMOVED J4 WAS 8WAY CONN J5 REMOVED-SEE SHEET 2 IL 22.4.80
7	ECO. 1166. 1154. R1 WAS 18K R10. R13. R14. R15. R16. R17. R18. R19. R20. C3. C4. C5. C6. D5. D6. D7. D8 Q5. Q6 & LK1 ADDED IL 24.9.80
8	E.C.O 1199 R10 WAS 12 K JR 24.2.81

MD
MD
MD
MD
MD
MD
MD


J1
Q1
Q2
Q3
Q4
Q5
Q6
M1
C2
C5
C1
C6
C3
C4
R1
R2
R3
R4
R11
R12
R13
R14
R15
R16
D2
D1
R5
R6
R7
R8
R17
R18
R19
R20
FIT M1 IN 14 WAY DIL SOCKET 605060
PCB 410106-5
2 OFF
WIRE
400
STRIP 5mm BEFORE SOLDERING, WIRES TO PIN 6 & 9
1 OFF RELAY BRACKET. 450241.
STRIP 3mm & FIT CRIMP PINS 605057.

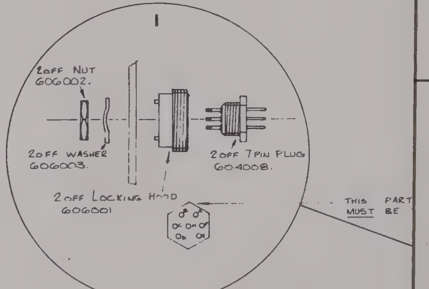
PROCEDURE.

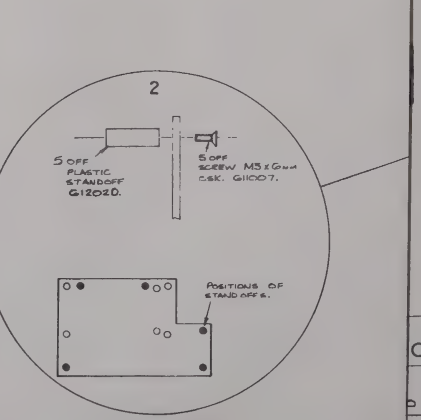
1/ FIT BOTH RELAYS TO THE BRACKET, (AS SHOWN) WITH WASHER & NUT.

2/ ON PINS 6 & 9 OF THE TWO POLE RELAY SOLDER 70mm OF WHITE WIRE PART No 540008 SLEEVE WITH ½ PIECE OF 590001 (I.E. 10mm).

3/ ALL OTHER CONTACTS ARE TO HAVE APPROXIMATELY 60mm OF 22 SWG TINNED COPPER WIRE PART Nº 540002 & SLEEVE EACH WITH ½ PIECE OF 590001.

4/ STAGGER LENGTHS OF TINNED COPPER WIRE, TO ASSIST FITTING TO P.C.B, AS SHOWN.


1
2 OFF NUT 606002.
2 OFF WASHER 606003.
2 OFF 7 PIN PLUG 604008.
2 OFF LOCKING HOOD 606001
THIS PART
MUST BE
2 OFF . PIN "B".


2
5 OFF PLASTIC STANDOFF 612020.
5 OFF SCREW M3 x 6mm CSK. 611007.
POSITIONS OF STAND OFFS.

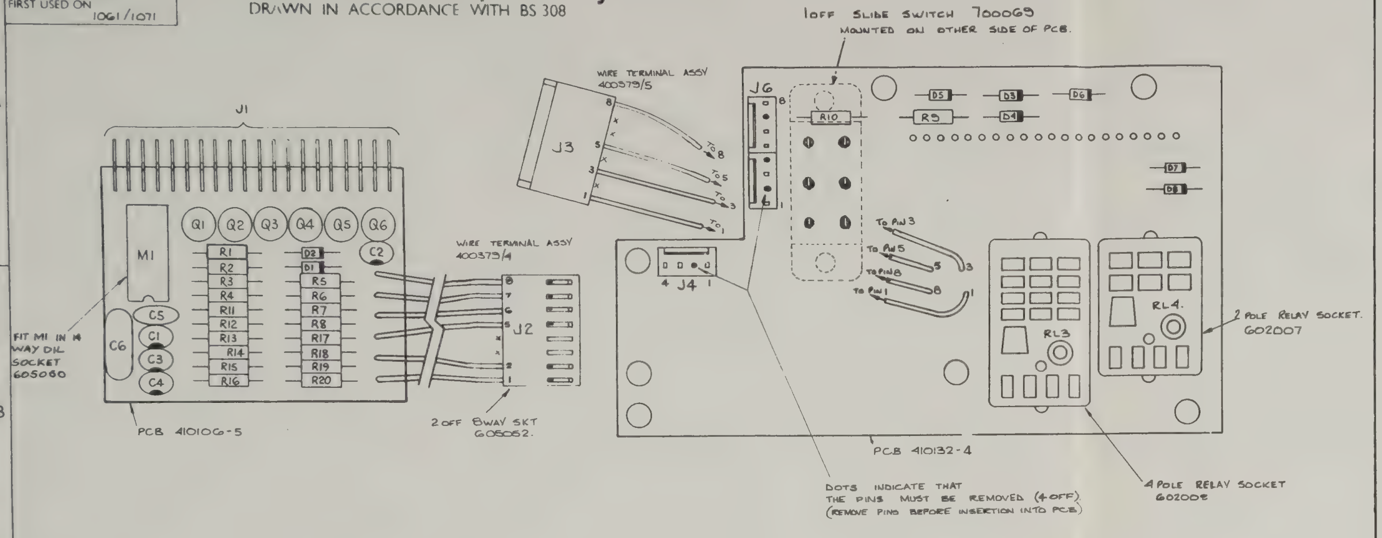
PROCEDURE

1/ ALL PINS ON EACH SOCKET EXCEPT PIN B (SHOWN SOLID), SOLDER ON 60mm OF TINNED COPPER WIRE. PART Nº 540002 & SLEEVE ALL JOINTS WITH APPROXIMATELY 16mm OF SLEEVING PART No 590001.
THERE SHOULD NOW BE 12 WIRES.

CTRONICS LTD. NORWICH.		DRAWING SIZE	A1
	DRAWING No.		SHEET
ASSY	400307		1 OF 8

DRAWING No
400307
FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308



1OFF SLIDE SWITCH 700069 MOUNTED ON OTHER SIDE OF PCB.
J1
M1
Q1
Q2
Q3
Q4
Q5
Q6
C2
C5
C6
C1
C3
C4
R1
R2
R3
R4
R11
R12
R13
R14
R15
R16
D2
D1
R5
R6
R7
R8
R17
R18
R19
R20
FIT M1 IN 14 WAY DIL SOCKET 605060
PCB 410106-5
WIRE TERMINAL ASSY 400379/4
J2
2OFF 8WAY SKT 605052.
WIRE TERMINAL ASSY 400379/5
J3
TO 8
TO 5
TO 3
TO 1
J6
J4
R10
R9
D5
D3
D6
D4
D7
D8
TO PIN 3
TO PIN 5
TO PIN 8
TO PIN 1
RL3
RL4.
2 POLE RELAY SOCKET. 602007
PCB 410132-4
DOTS INDICATE THAT THE PINS MUST BE REMOVED (4 OFF). (REMOVE PINS BEFORE INSERTION INTO PCB)
4 POLE RELAY SOCKET 602008

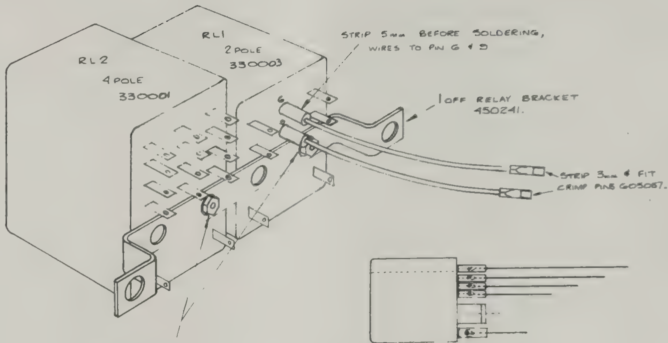
ALL BURRS TO BE REMOVED

NOTES

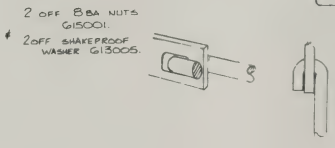
IMPORTANT.

FOR CRIMP PINS USE TOOL N° HTR2262A.

	CHANGES	
A		
1	RELEASED 26-3-79	
2	LK1 REPLACED BY R10 (000100) D6 DELETED ECO 902/887 5 JUNE 79 W.G.S	MD
3	ECO 972. 25-10-79 RL1, RL2, RL3 & RL4. WERE ITT. B.J.	MD
4	ECO 981. 6-11-79. R9 WAS 33K. B.J R10 WAS 10Ω R11 & R12 ADDED D7 ADDED D5 DELETED 400379/4 1off ADDED PCBS UP-DATED	MD
5	ECO 1021 . 1034. R18 MOVED & WAS 33K NOW 1M LK1 ADDED D7 & R10 DELETED R9 WAS 18K. B.J 2-1-80	MD
6	ECO 1085 POLARISING KEY FOR J3 REMOVED J4 WAS 8WAY CONN J5 REMOVED-SEE SHEET 2 IL 22.4.80	MD
7	ECO. 1166. 1154. R1 WAS 18K R10. R13. R14. R15. R16. R17. R18. R19. R20. C3. C4. C5. C6. D5. D6. D7. Q5. Q6 & LK1 ADDED D8 IL 24 9 80	MD
8	ECO 1199 R10 WAS 12 K JR 24 2 81	MD



RL2
4 POLE
330001
RL1
2 POLE
330003
STRIP 5mm BEFORE SOLDERING, WIRES TO PIN 6 & 9
6
1OFF RELAY BRACKET 450241.
STRIP 3mm & FIT CRIMP PINS 605067.



2 OFF 8BA NUTS G15001.
& 2OFF SHAKEPROOF WASHER G13005.

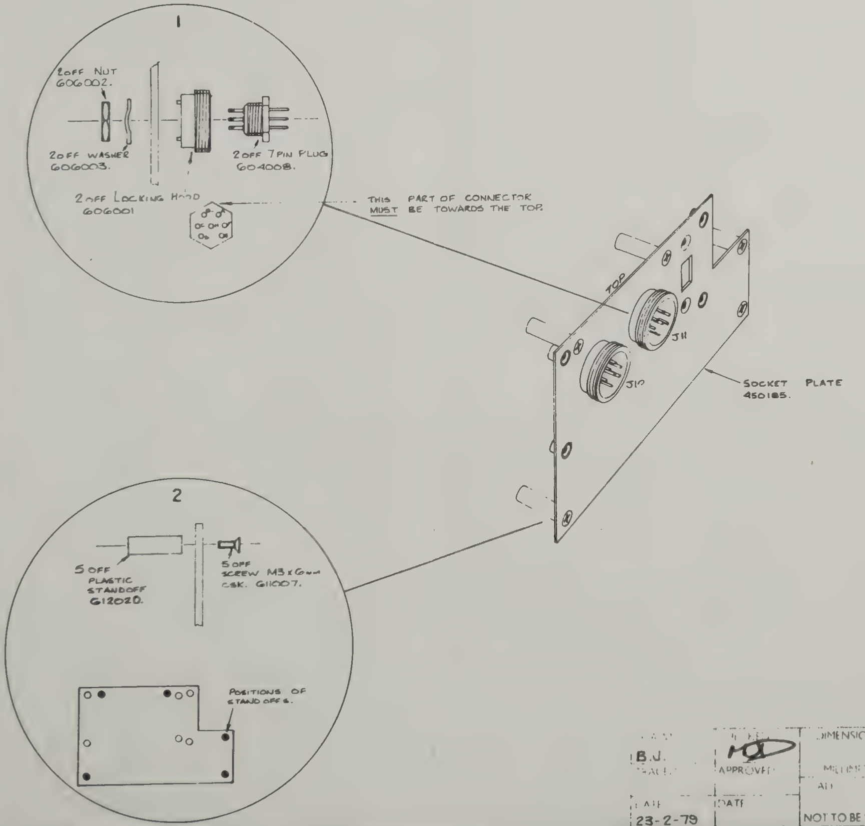
PROCEDURE.

1/ FIT BOTH RELAYS TO THE BRACKET (AS SHOWN) WITH WASHER & NUT.

2/ ON PINS 6&9 OF THE TWO POLE RELAY SOLDER 70mm OF WHITE WIRE PART No 540008 SLEEVE WITH 1/2 PIECE OF 590001 (1≠ 10mm).

3/ ALL OTHER CONTACTS ARE TO HAVE APPROXIMATELY 60mm OF 22 SWG TINNED COPPER WIRE PART N° 540002 & SLEEVE EACH WITH 1/2 PIECE OF 590001.

4/ STAGGER LENGTHS OF TINNED COPPER WIRE, TO ASSIST FITTING TO PCB, AS SHOWN.

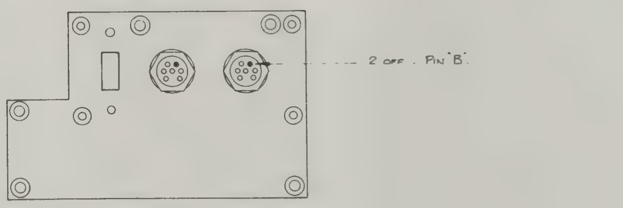


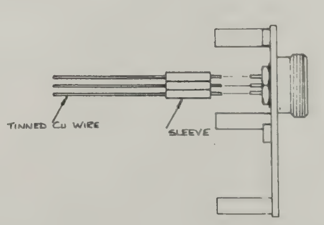
1
2OFF NUT 606002.
2OFF WASHER 606003.
2OFF 7PIN PLUG 604008.
2OFF LOCKING HOOD 606001
THIS PART OF CONNECTOR MUST BE TOWARDS THE TOP.
TOP
J11
J10
SOCKET PLATE 450185.
2
5 OFF PLASTIC STANDOFF G12020.
5 OFF SCREW M3x6mm CSK. G11007.
POSITIONS OF STAND OFF'S.

PROCEDURE.

1/ ASSEMBLE THE 7 PIN PYE PLUGS. FIRST & ENSURE THAT THE CONNECTORS ARE SECURED IN THE POSITION SHOWN.

2/ ASSEMBLE THE 5 STANDOFF'S IN THE POSITION SHOWN BY THE LARGE DOTS.





TINNED Cu WIRE
SLEEVE

PROCEDURE

1/ ALL PINS ON EACH SOCKET EXCEPT PIN B (SHOWN SOLID), SOLDER ON 60mm OF TINNED COPPER WIRE. PART N° 540002 & SLEEVE ALL JOINTS WITH APPROXIMATELY 16mm OF SLEEVING PART No 590001.
THERE SHOULD NOW BE 12 WIRES.

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	MATERIAL
B.J.	MD	MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	
TRACED	APPROVED	ALL	ANGULAR ± °	FINISH
DATE 23-2-79	DATE	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE A1

TITLE
REAR INPUT / RATIO ASSY

DRAWING No. 400307

SHEET 1 OF 8

DRAWING No.
400307.

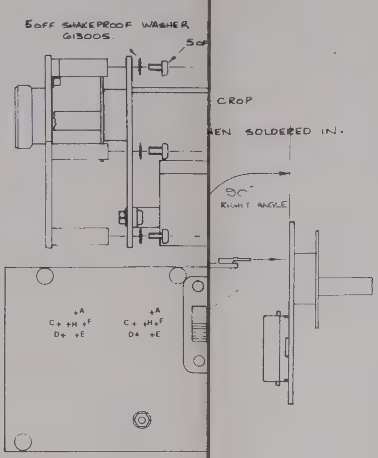
FIRST USED ON
1061/71

THIRD ANGLE

DRAWN IN ACCORDANCE WI

NOTES

ISS.	CHANGES	
A		
1	RELEASED 26-3-79	
2	ECO902/[illegible] SEE SHT 1 5 JUNE 79 W.G.S.	MD
3	SEE SHT 1. 25-10-79. BJ	MD
4	SEE SHT. 1. 6-11-79 BJ	MD
5	SEE SHT. 1. 2-1-80. BJ	
6	ECO. 1085 J5 WAS 8 WAY CONN. IL 22.4.80	MD
7	SEE SHEET 1 24.9.80	
8	SEE SHEET 1 24.2.81	


5 OFF SHAKEPROOF WASHER
G13005.
5 OF
CROP
EN SOLDERED IN.
90°
RIGHT ANGLE
C+ +H +F
+A
D+ +E
C+ +H+F
+A
D+ +E

1/ SKETCH BELOW SHOWS THE 2 RELAY & BRACKET ASSEMBLY (FROM SHEET 1). THE CROSSES INDICATE HOLES IN THE P.C.B INTO WHICH THE WIRES FROM THE RELAYS ARE INSERTED.

PROCEDURE

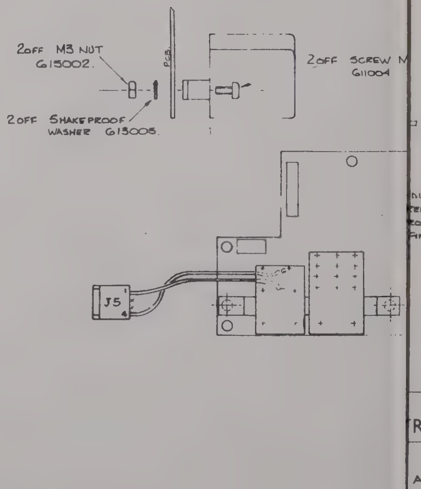
① INSERT THE WIRES INTO THE APPROPRIATE HOLES IN THE PCB (WIRE'S CUT AT DIFFERENT LENGTHS TO AID ASSEMBLY).

② WHEN THE WIRES ARE ALL IN PLACE SECURE THE BRACKET TO THE PCB USING THE SCREWS, WASHERS & NUTS SHOWN BELOW.

③ SOLDER & CROP WIRES IN THE USUAL MANNER. INSERT THE CRIMP PINS INTO SOCKET J5 PIN 6 OF RELAY TO PIN 4 OF J5 & PIN 9 TO PIN 1 AS SHOWN BELOW.

1 OFF CLIP G30005. (2 POLE)
1 OFF CLIP G30028. (4 POLE)

1 OFF 2 POLE RELAY 330003.
1 OFF 4 POLE RELAY 330001


2 OFF M3 NUT
G15002.
PCB
2 OFF SCREW M
G11004
2 OFF SHAKEPROOF
WASHER G13005.
J5

DURE IS TO PLUG IN
RELAYS & HOLD IN PLACE
ROVIDED AS DETAILED IN
FINISHED VIEW.

DRAWING SIZE
A1

RONICS LTD. NORWICH.

ASSY.

DRAWING No.
400307

SHEET
2 OF 8

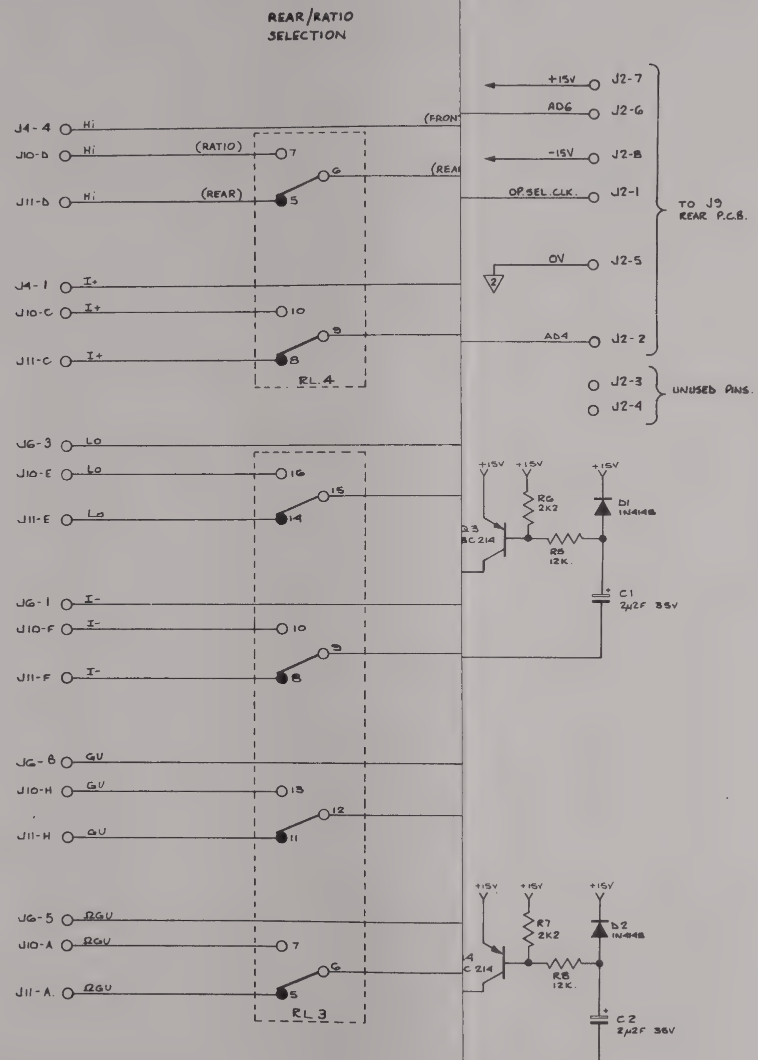
DRAWING No.	430307
FIRST USED ON	1061/1071

THIRD ANGLE PR

DRAWN IN ACCORDANCE WITH BS 308

NOTES

ISS	CHANGES
1	RELEASED 26-3-79.
2	LK1 REPLACED BY R10 10Ω D6 DELETED E.C.O 802/887 5 JUNE 79 W.G.S
3	ECO 981. 6-11-79. B.J. R9 WAS 33K. R10 " 10Ω. R11 & R12 ADDED D7 ADDED 1off 400379/4 ADDED. D5 DELETED.
4.	ECO 1021 & 1054. B.J. R12 WAS JOINED TO J2-6 & M1-14. LK1 ADDED. R9 WAS 18K D7 & R10 DELETED. 2-1-80
5	ECO. 1085 B5_BETWEEN J4-1 & J5-1 REMOVED PINS OF J4 & J5 RE-NUMBERED FOR 4 WAY CONNECTORS IL 22.4.80
6	ECO. 1166. 1154 R1 WAS 18k R10. R13. R14. R15. R16. R17. R18. R19. R20. C3. C4. C5. C6. D5. D6. D7. D8. Q5. Q6. ADDED IL 24.9.80
7	ECO 1199 R10 WAS 12K JR 24.2.81



A
B
C
D
REAR/RATIO
SELECTION
J4-4
Hi
J10-D
Hi
(RATIO)
J11-D
Hi
(REAR)
(FRONT
(REAR
7
6
5
J4-1
I+
J10-C
I+
J11-C
I+
10
9
8
RL.4
+15V
J2-7
AD6
J2-6
-15V
J2-8
OP.SEL.CLK.
J2-1
TO J9
REAR P.C.B.
0V
J2-5
2
AD4
J2-2
J2-3
J2-4
UNUSED PINS.
J6-3
Lo
J10-E
Lo
J11-E
Lo
16
15
14
+15V
+15V
+15V
Q3
BC214
R6
2K2
R5
12K.
D1
1N4148
C1
2μ2F 35V
J6-1
I-
J10-F
I-
J11-F
I-
10
9
8
J6-8
GU
J10-H
GU
J11-H
GU
13
12
11
+15V
+15V
+15V
R7
2K2
R8
12K.
D2
1N4148
C2
2μ2F 35V
J6-5
ΩGU
J10-A
ΩGU
J11-A.
ΩGU
7
6
5
RL3

NOTE: J4&J6 ARE FROM THE FRONT PANEL TERMINALS.

J10. IS THE RATIO INPUT SOCKET ON REAR PANEL.

J11. IS THE REAR INPUT SOCKET ON REAR PANEL.

E

LTD. NORWICH.

RCUIT.

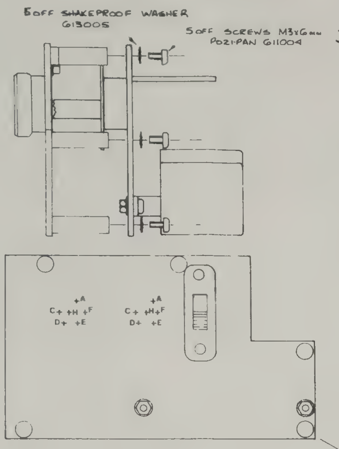
DRAWING SIZE	
A1	
DRAWING No.	SHEET
430307	1 OF 1

DRAWING No
400307
FIRST USED ON
1061/71

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

NOTES

ISS	CHANGES
A	
1	RELEASED 26-3-79
2	ECO902/~~79~~ SEE SHT 1 5 JUNE 79 WGS
3	SEE SHT 1 25-10-79 BJ
4	SEE SHT 1 6-11-79 BJ
5	SEE SHT. 1 2-1-80 BJ
6	ECO 1085 J5 WAS 8 WAY CONN. IL 22.4.80
7	SEE SHEET 1 24.9.80
8	SEE SHEET 1 24.2.81


5OFF SHAKEPROOF WASHER
G13005
5OFF SCREWS M3x6mm
POZI-PAN G11004
+A
C+ +H +F
D+ +E
+A
C+ +H +F
D+ +E

3./ BOTTOM VIEW SHOWS THE HOLES IN THE P.C.B (INDICATED BY CROSSES). THESE HOLES ARE FOR THE WIRES FROM THE TWO 7 PIN SOCKETS
IT IS A SUGGESTION THAT THE WIRES ARE STAGGERED TO MAKE ASSY EASIER (AS WIRING THE RELAYS).

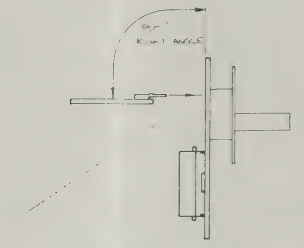
PROCEDURE.

① THE WIRES SHOULD LINE UP WITH THE APPROPRIATE HOLES. IE. WIRE FROM PIN 'A' OF SOCKET SHOULD BE INSERTED INTO HOLE 'A', WIRE FROM PIN 'C' TO HOLE 'C' AND SO ON.

② WHEN THE WIRES ARE INSERTED IN THE APPROPRIATE HOLES. SECURE THE 2 ASSY'S TOGETHER WITH THE M3x6mm POZI-PAN SCREWS & SHAKEPROOF WASHERS, SCREWED IN THE 5 STANDOFFS. (AS DETAILED)

③ LIGHTLY PULL ON THE TIN COPPER WIRES SO THE WIRE IS TAUT, THEN SOLDER & CROP IN THE USUAL MANNER.

2./ INSERT CONNECTORS AS SHOWN
SOLDER ALL 20 AMP PINS & CROP LEGS IN USUAL MANNER
THE BOARD IS TO BE AT 90° WHEN SOLDERED IN.


90°
RIGHT ANGLE

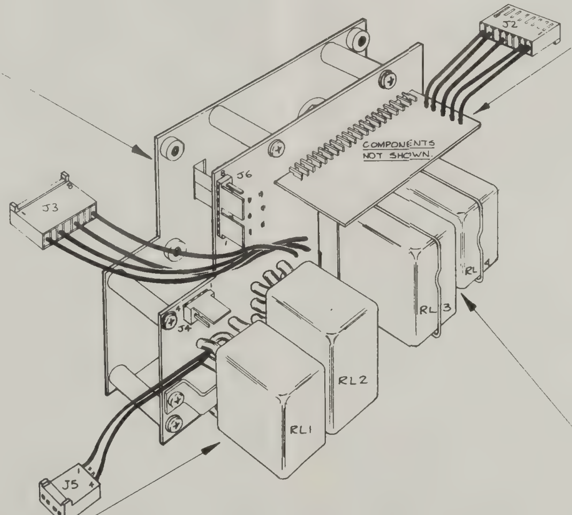
1./ SKETCH BELOW SHOWS THE 2 RELAY & BRACKET ASSEMBLY (FROM SHEET 1). THE CROSSES INDICATE HOLES IN THE P.C.B INTO WHICH THE WIRES FROM THE RELAYS ARE INSERTED.

PROCEDURE

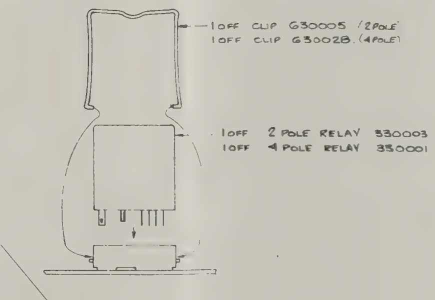
① INSERT THE WIRES INTO THE APPROPRIATE HOLES IN THE PCB (WIRE'S CUT AT DIFFERENT LENGTHS TO AID ASSEMBLY).

② WHEN THE WIRES ARE ALL IN PLACE SECURE THE BRACKET TO THE PCB USING THE SCREWS, WASHERS & NUTS SHOWN BELOW.

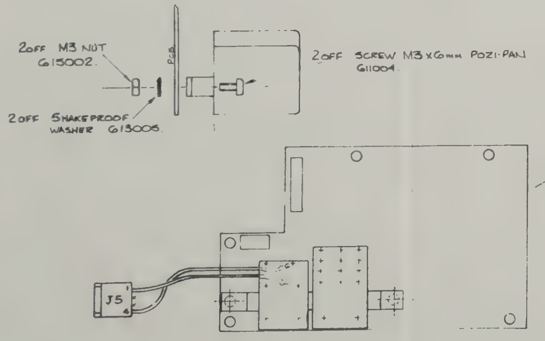
③ SOLDER & CROP WIRES IN THE USUAL MANNER. INSERT THE CRIMP PINS INTO SOCKET J5 PIN 6 OF RELAY TO PIN 4 OF J5 & PIN 9 TO PIN 1 AS SHOWN BELOW


J2
COMPONENTS NOT SHOWN.
J6
J3
J4
RL1
RL2
RL3
RL
J5

FINISHED ASSEMBLY.


1OFF CLIP G30005 (2POLE)
1OFF CLIP G30028. (4POLE)
1OFF 2 POLE RELAY 330003
1OFF 4 POLE RELAY 330001

4./ THE LAST PROCEDURE IS TO PLUG IN THE 4 & 2 POLE RELAYS & HOLD IN PLACE BY THE CLIPS PROVIDED AS DETAILED IN ABOVE SKETCH & FINISHED VIEW.


2OFF M3 NUT
G15002.
PCB
2OFF SCREW M3x6mm POZI-PAN
G11004.
2OFF SHAKEPROOF WASHER G13005.
J5

B.J.
2-3-79
APPROVED
DATE
DIMENSIONS IN
MILLIMETRES
NOT TO BE SCALED
TOLERANCES ANGULAR ± °
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± .005
DECIMAL TO 2 PLACES ± .010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED
MATERIAL
FINISH
datron ELECTRONICS LTD. NORWICH.
TITLE
REAR INPUT / RATIO ASSY.
DRAWING SIZE
A1
DRAWING No.
400307
SHEET
2 OF 8

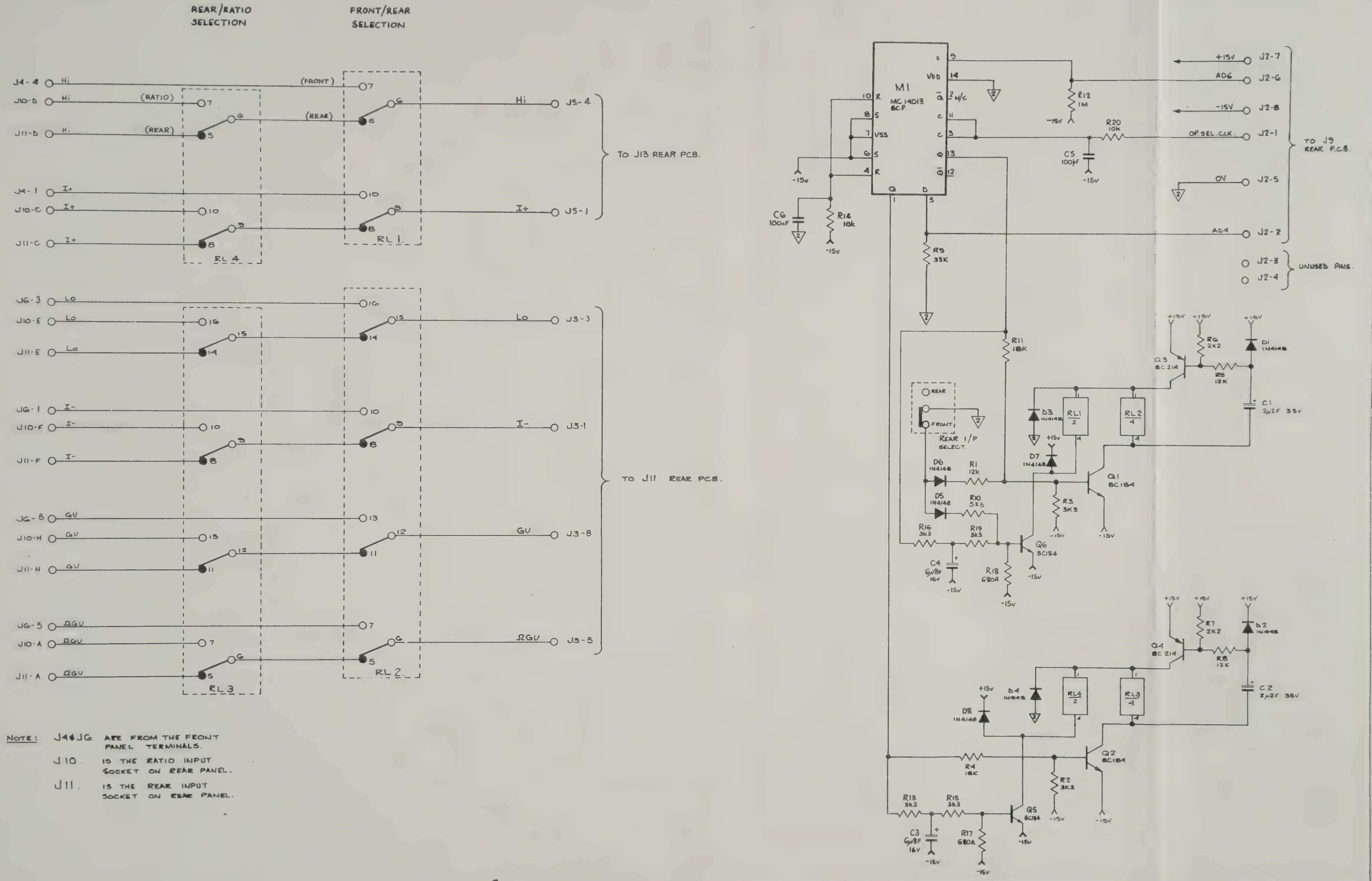
DRAWING No
430307
FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS	CHANGES
1	RELEASED 26-3-79.
2	LK1 REPLACED BY R10 10Ω D6 DELETED ECO 902/887 5 JUNE 79 WGS
3	ECO 981. 6-11-79. BJ R9 WAS 33K R10 " 10Ω. R11 & R12 ADDED D7 ADDED 1off 400379/4 ADDED. D5 DELETED.
4.	ECO 1021 & 1034. BJ R12 WAS JOINED to J2-6 & M1-14. LK1 ADDED. R9 WAS 18K D7 & R10 DELETED. 2-1-80
5	ECO. 1086 BS_BETWEEN J4-1 & J5-1 REMOVED PINS OF J4 & J5 RE-NUMBERED FOR 4 WAY CONNECTORS JL 22.4.80
6	ECO 1166. 1154 R1 WAS 18k R10. R13. R14. R15. R16. R17. R18. R19. R20. C3. C4. C5. C6. D5. D6. D7. D8 Q5. Q6. ADDED JL 24 9 80
7	ECO 1199 R10 WAS 12K JR 24.2.81


REAR/RATIO SELECTION
FRONT/REAR SELECTION
J4-4 Hi
J10-D Hi
J11-D Hi
(FRONT)
(RATIO)
(REAR)
Hi J5-4
TO J13 REAR PCB.
J4-1 I+
J10-C I+
J11-C I+
I+ J5-1
RL 1
RL 4
J6-3 Lo
J10-E Lo
J11-E Lo
Lo J3-3
J6-1 I-
J10-F I-
J11-F I-
I- J3-1
TO J11 REAR PCB.
J6-8 GU
J10-H GU
J11-H GU
GU J3-8
J6-5 ΩGU
J10-A ΩGU
J11-A ΩGU
ΩGU J3-5
RL 2
RL 3
M1 MC 14013 BCP.
VDD VSS
+15V J2-7
AD6 J2-6
-15V J2-8
OP.SEL.CLK. J2-1
0V J2-5
AD4 J2-2
J2-3 J2-4 UNUSED PINS.
TO J9 REAR P.C.B.
R12 1M
R20 10K
C5 100pF
C6 100nF
R14 10k
R9 33K
R11 18K
REAR FRONT REAR I/P SELECT.
D6 IN4148
R1 12k
D5 IN4148
R10 5K6
R16 3k3
R19 3k3
C4 6µ8F 16V
R18 680R
Q6 BC184
D3 IN4148
RL1 2
RL2 4
D7 IN4148
Q1 BC184
R3 3K3
Q3 BC214
R6 2K2
R5 12K
D1 IN4148
C1 2µ2F 35V
Q4 BC 214
R7 2K2
R8 12K
D2 IN4148
C2 2µ2F 35V
D4 IN4148
D8 IN4148
RL4 2
RL3 4
Q2 BC184
R4 18K
R2 3K3
R13 3k3
R15 3k3
Q5 BC184
C3 6µ8F 16V
R17 680R
+15V
-15V

NOTE: J4&J6 ARE FROM THE FRONT PANEL TERMINALS.
J10. IS THE RATIO INPUT SOCKET ON REAR PANEL.
J11. IS THE REAR INPUT SOCKET ON REAR PANEL.

DRAWN B.J
CHECKED
APPROVED
DATE 9-3-79
DATE
DIMENSIONS IN MILLIMETRES
SCALE
NOT TO BE SCALED

TOLERANCES ANGULAR ± °
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± .005
DECIMAL TO 2 PLACES ± .010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED

MATERIAL
FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE
REAR INPUT / RATIO CIRCUIT.

DRAWING SIZE
A1
DRAWING No.
430307
SHEET
1 OF 1

1

DRAWING No.
400308.

FIRST USED ON
1061 – 1071

THIRD AN

DRAWN IN ACCORDA

6

NOTES

ISS.	CHANGES
1	RELEASED. 27-DEC-78. W.G.S.
2	POSITION OF TAG ON M1+M2 CORRECTED. D2 POSITION REVERSED. ECO. 907 20.6.79 IL
3	PARTS LIST CHANGE TO R7 ECO. 945 10.9.79 IL

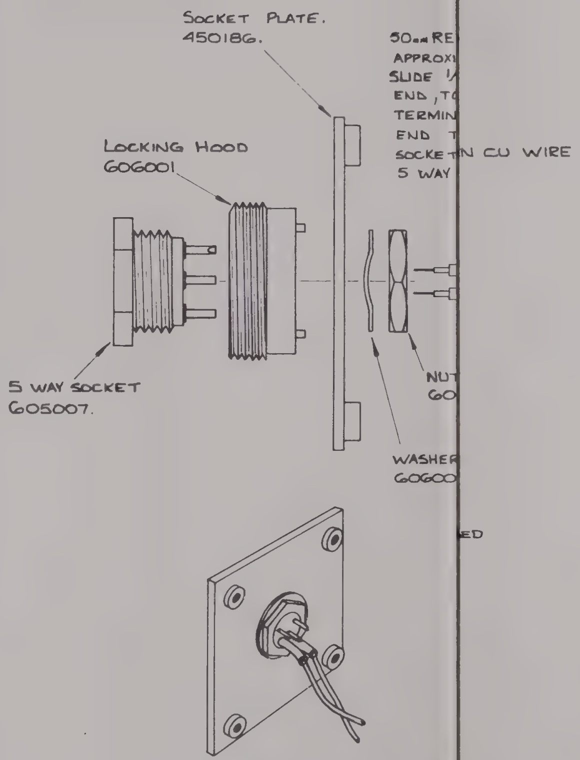
BJ

A

B

C

D


SOCKET PLATE.
450186.
50mm RE
APPROX
SLIDE 1/
END, TO
TERMIN
END T
SOCKET TIN CU WIRE
5 WAY
LOCKING HOOD
606001
5 WAY SOCKET
605007.
NUT
60
WASHER
60600
ED

SECURE WHOLE ASSY BY
TIGHTENING NUT. (AS ABO

DRAWN
B.J.

CHECKED

TRACED

APPROVED

DATE
27-11-78

DATE

DIMENSIONS IN
MILLIMETRES

SCALE
2 : 1
NOT TO BE SCALED

TOLERANCES
INCH DIMENSION
DECIMAL TO 3
DECIMAL TO 2
FRACTIONAL
METRIC DIMENSIO
DECIMAL TO 2
DECIMAL TO 1
WHOLE DIME
UNLESS OTHERW

NORWICH.

DRAWING SIZE
A2

DRAWING No.
400308

SHEET
1 of 4

DRAWING No.
430308

FIRST USED ON
1061 - 1071

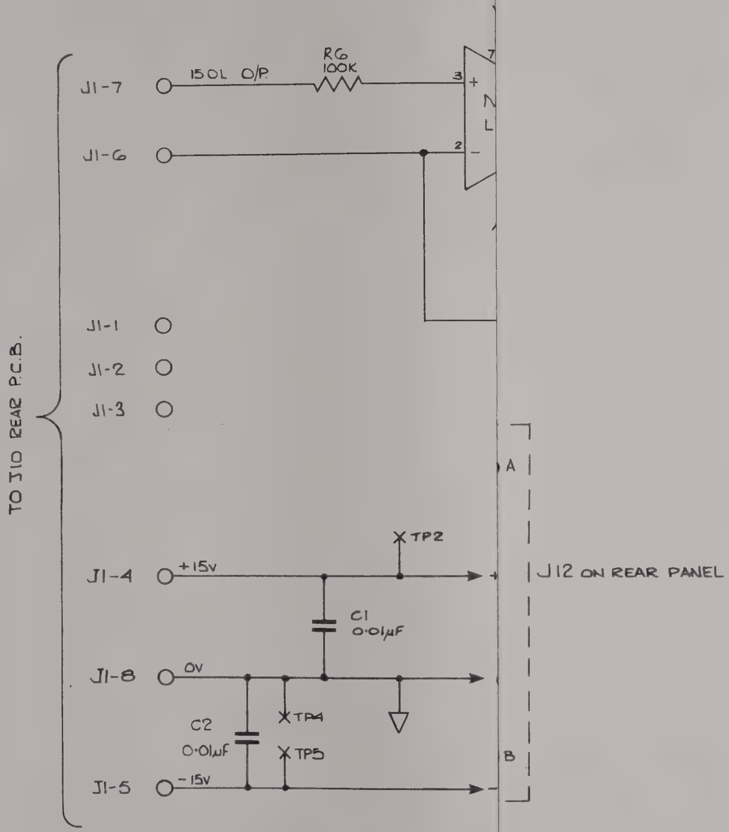
THIRD ANGL

DRAWN IN ACCORDANCE WI

NOTES

ISS.	CHANGES
1	RELEASED. 27-DEC-78. W.A.S.
2	R7 WAS 21k73 ECO. 845 10.9.79 IL

BJ


TO J10 REAR P.C.B.
J1-7
15OL O/P.
R6
100K
3
+
7
N
L
2
−
J1-6
J1-1
J1-2
J1-3
A
J1-4
+15v
TP2
+
C1
0·01μF
J1-8
0V
C2
0·01μF
TP4
TP5
J12 ON REAR PANEL
B
J1-5
−15v

DRAWN	CHECKED	DIMENSIONS IN
B.J.	M	——
TRACED	APPROVED	MILLIMETRES
		SCALE
DATE	DATE	——
29-11-78		NOT TO BE SCALED

TOLERANCES ANG
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± ·0
DECIMAL TO 2 PLACES ± 0
FRACTIONAL ± 1/
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1
DECIMAL TO 1 PLACE ± 2
WHOLE DIMENSIONS ± 4
UNLESS OTHERWISE STATED

WICH.

DRAWING SIZE
A2

DRAWING No.
430308

SHEET
1 OF 1

DRAWING No.	400308.
FIRST USED ON	1061 - 1071

THIRD ANGLE PROJECTION

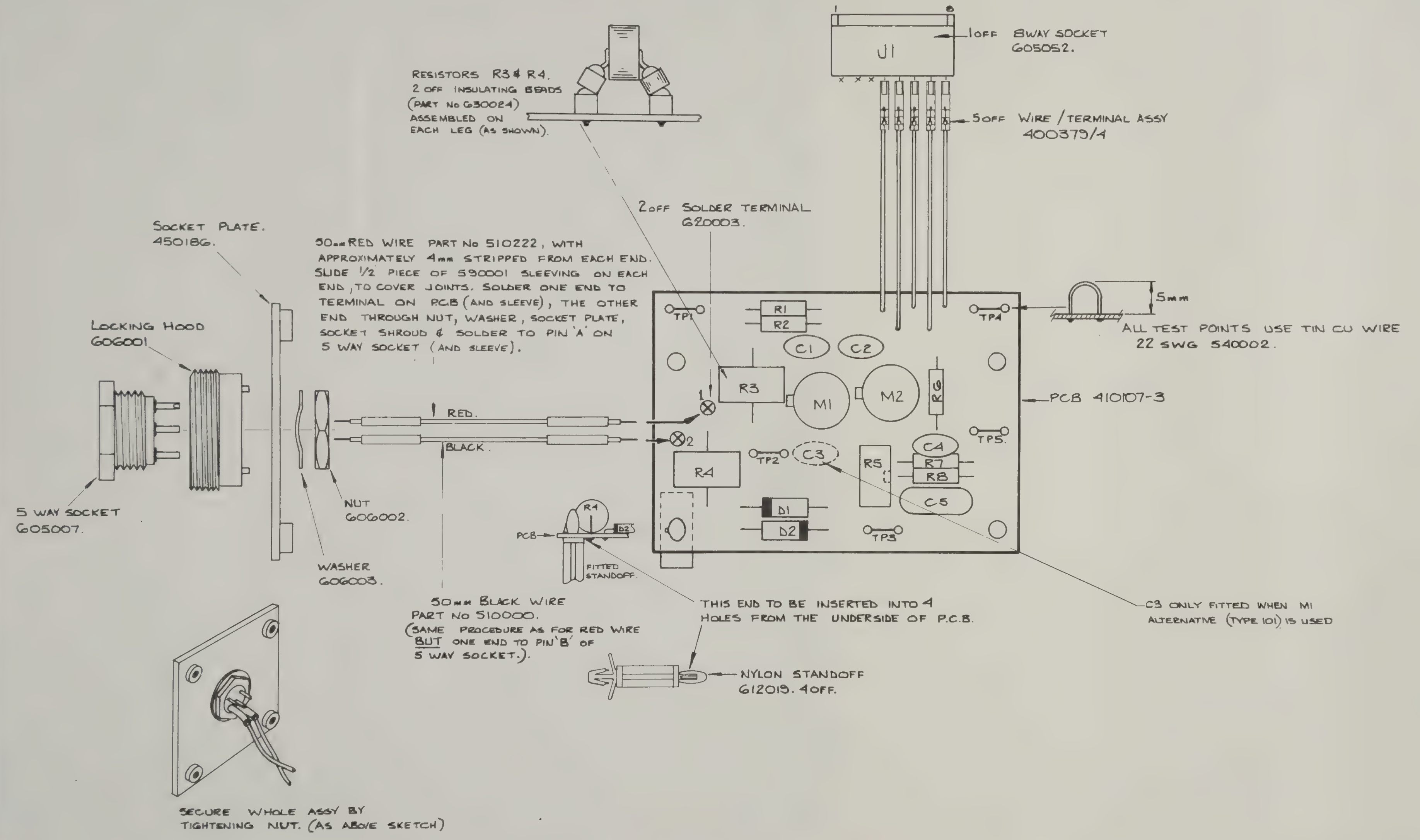
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
1	RELEASED. 27-DEC-78. W.G.S.
2	POSITION OF TAG ON M1 & M2 CORRECTED. D2 POSITION REVERSED. ECO. 907 20.6.79 IL
3	PARTS LIST CHANGE TO R7 ECO. 945 10.9.79 IL

BJ



1 OFF 8WAY SOCKET 605052.

5 OFF WIRE / TERMINAL ASSY 400379/4

RESISTORS R3 & R4. 2 OFF INSULATING BEADS (PART No 630024) ASSEMBLED ON EACH LEG (AS SHOWN).

2 OFF SOLDER TERMINAL 620003.

SOCKET PLATE. 450186.

50mm RED WIRE PART No 510222, WITH APPROXIMATELY 4mm STRIPPED FROM EACH END. SLIDE 1/2 PIECE OF 590001 SLEEVING ON EACH END, TO COVER JOINTS. SOLDER ONE END TO TERMINAL ON P.C.B (AND SLEEVE), THE OTHER END THROUGH NUT, WASHER, SOCKET PLATE, SOCKET SHROUD & SOLDER TO PIN 'A' ON 5 WAY SOCKET (AND SLEEVE).

ALL TEST POINTS USE TIN CU WIRE 22 SWG 540002.

PCB 410107-3

LOCKING HOOD 606001

5 WAY SOCKET 605007.

NUT 606002.

WASHER 606003.

FITTED STANDOFF.

50mm BLACK WIRE PART No 510000. (SAME PROCEDURE AS FOR RED WIRE BUT ONE END TO PIN 'B' OF 5 WAY SOCKET.).

THIS END TO BE INSERTED INTO 4 HOLES FROM THE UNDERSIDE OF P.C.B.

NYLON STANDOFF 612019. 4 OFF.

C3 ONLY FITTED WHEN M1 ALTERNATIVE (TYPE 101) IS USED

SECURE WHOLE ASSY BY TIGHTENING NUT. (AS ABOVE SKETCH)

DRAWN B.J.	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± 1/2° INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED
TRACED	APPROVED	SCALE 2:1 NOT TO BE SCALED	
DATE 27-11-78	DATE		

MATERIAL

FINISH

datron ELECTRONICS LTD. NORWICH.

TITLE	DRAWING No.	SHEET
ANALOGUE OUTPUT P.C.B ASSY	400308	1 of 4

DRAWING SIZE A2

DRAWING No.
430308
FIRST USED ON 1061 - 1071

THIRD ANGLE PROJECTION

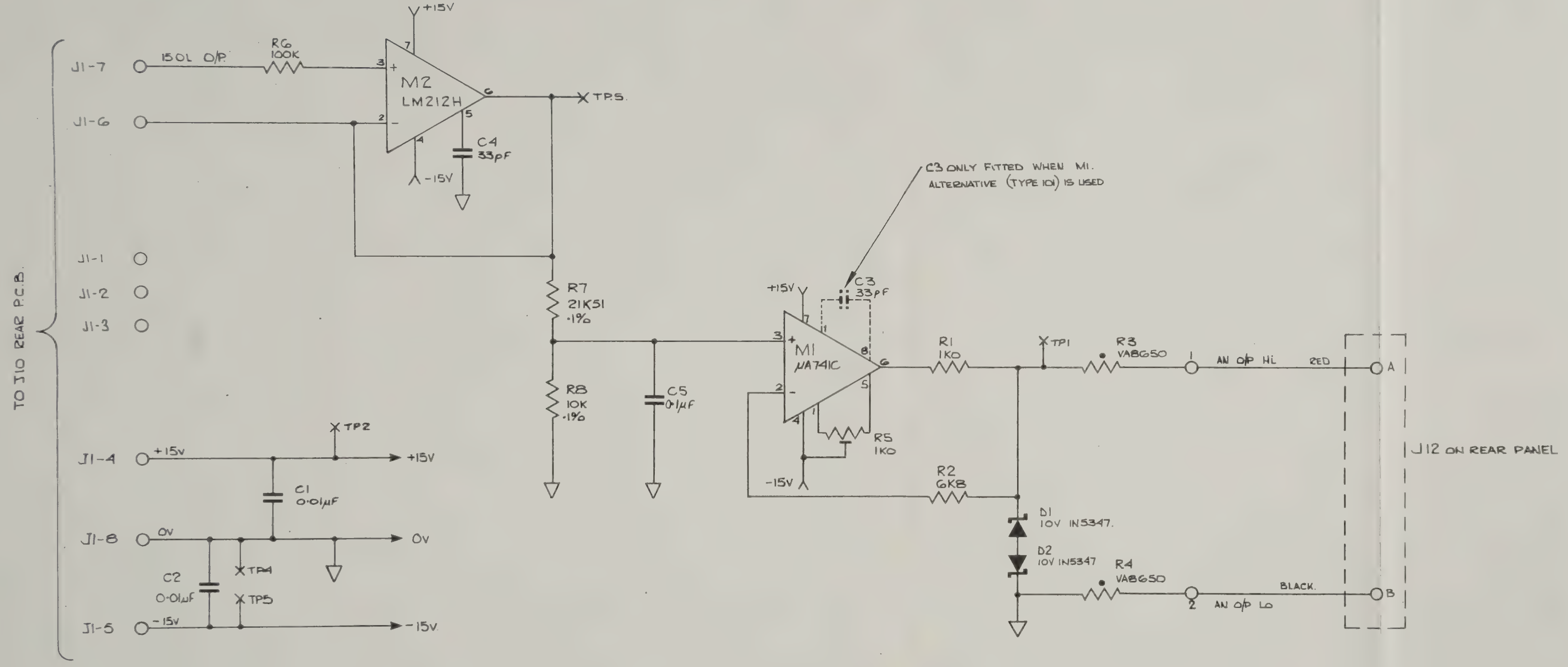
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
1	RELEASED. 27·DEC·78. W.G.S.
2	R7 WAS 21K78 ECO. 845 10.9.79 IL

BJ



+15V
J1-7
150L O/P.
R6
100K
M2
LM212H
TP.S.
J1-6
C4
33pF
-15V
C3 ONLY FITTED WHEN M1. ALTERNATIVE (TYPE 101) IS USED
J1-1
J1-2
J1-3
TO J10 REAR P.C.B.
R7
21K51
·1%
+15V
C3
33pF
M1
μA741C
R1
1KΩ
TP1
R3
VA8650
1
AN O/P HI
RED
A
R8
10K
·1%
C5
0·1μF
R5
1KΩ
J12 ON REAR PANEL
TP2
J1-4
+15v
+15V
C1
0·01μF
-15V
R2
6K8
D1
10V IN5347.
J1-8
0V
0v
TP4
D2
10V IN5347
R4
VA8650
C2
0·01μF
TP5
BLACK.
B
2
AN O/P LO
J1-5
- 15v
-15V.

DRAWN B.J.	CHECKED M	DIMENSIONS IN —— MILLIMETRES	TOLERANCES ANGULAR + ½° INCH DIMENSIONS DECIMAL TO 3 PLACES ± ·005 DECIMAL TO 2 PLACES ± ·010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ∓ 4mm UNLESS OTHERWISE STATED	MATERIAL
TRACED	APPROVED			
DATE 29-11-78	DATE	SCALE —— NOT TO BE SCALED		FINISH

J.W.1962

datron ELECTRONICS LTD. NORWICH.

TITLE	DRAWING No.	DRAWING SIZE
ANALOGUE OUTPUT CIRCUIT.	430308	A2
		SHEET 1 OF 1

1	7

DRAWING No
400328
FIRST USED ON
1061

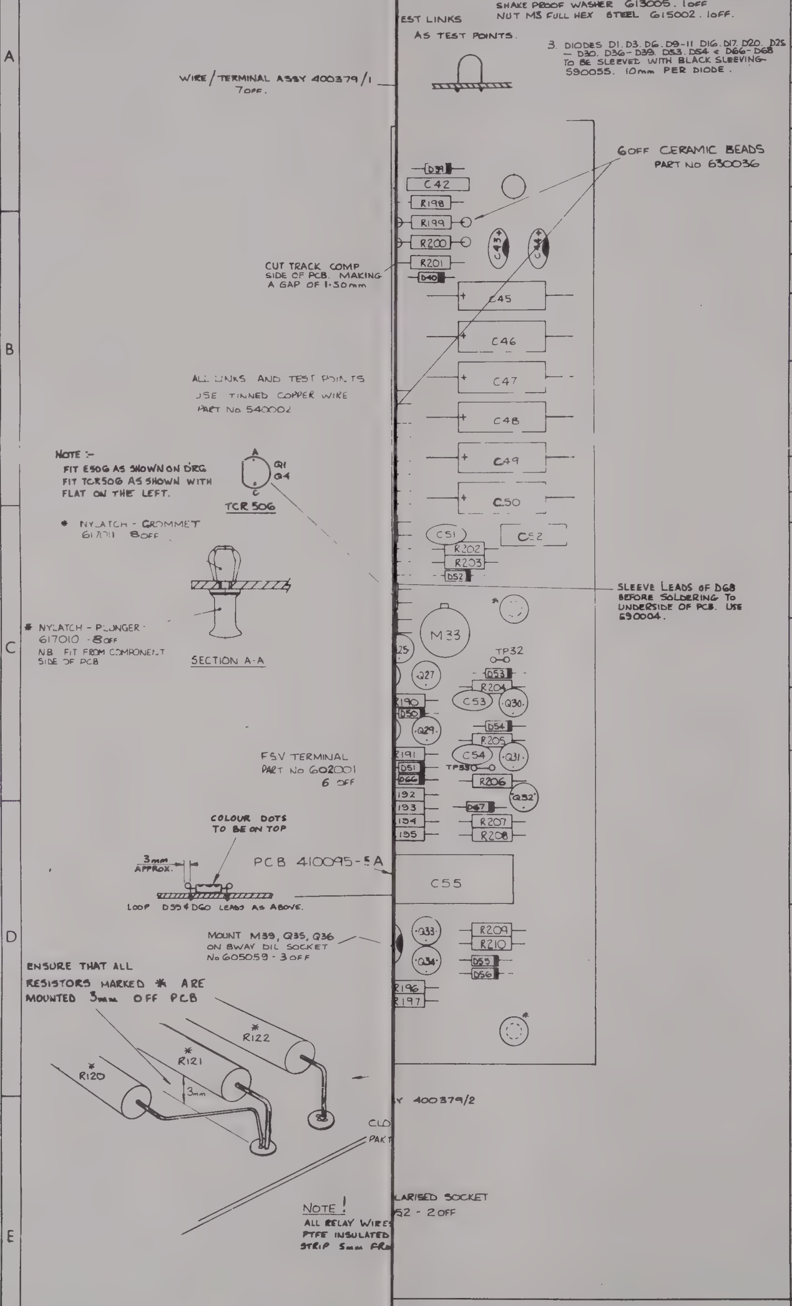
THIRD A

DRAWN IN ACCORD

NOTES

1. SOLDER PCB TERMINAL LUG PART Nº 620005. 4 OFF SHOWN AS ⊗
2. FIX RELAY BRACKET 459112 TO PCB WITH SCREW M3X6mm POZI-PAN 611004. 1 OFF. SHAKE PROOF WASHER 613005. 1 OFF NUT M3 FULL HEX STEEL 615002. 1 OFF.
3. DIODES D1. D3. D6. D9-11 D16. D17. D20. D25 – D30. D36–D39. D53. D54 & D66–D68 TO BE SLEEVED WITH BLACK SLEEVING 590055. 10mm PER DIODE.

ISS.	CHANGES	
A		
B	UPDATED PCB.	
1	RELEASED TO PRODN 23-11-78	
2	R48 WAS 10K (000108) R104 & R105 WAS 270R (000271) M17 WAS 14011 (280008) ECO 807 26-FEB-79 W.G.S.	MD
3	COMPONENT VALUES CHANGED. REFER TO ECO. 826 & ECO 854. 4.4.79. IL	MC
4	COMPONENT VALUES CHANGED. REFER TO ECO 853. 23-4-79. B.J.	MD
5	D57 REMOVED & PTs. LT CHANGE TO R24. ECO. 886/810/904 IL 19.6.79	MD
6	ECO 929. D40 HAS BEEN RE-INSTATED. B.J. 16-7-79.	MD
7	ECO.937 PCB. RAISED TO ISS.6A IL 4.9.79	B.J.
8	ECO 955 C59 ADDED ACROSS M16-8 & M16-11 IL 20.9.79	MD
9	ECO 963, 972 & 985. C30 REMOVED. CHANGED , R182, R183, C31, C35, M36 & RL1 B.J. 12-10-79	MD
10	ECO 987, 989 & 997. RELAY WIRES WERE PVC INSULATED. R57 WAS 47R R127 WAS 10M (041006) R219, 220, 221 & 222. WERE IN: CR23 R227 & C60 ADDED B.J. 30-10-79	MD
11	ECO 1000 SOCKET CLIP 606005 WAS 606007 IL 18.1.80	MD
12	ECO 1049. 1072. 1077 PARTS LIST CHANGES IL 27.2.80	MD
13	ECO.1098. 1107 CLOVERLEAFS WERE 18 OFF. D58 REMOVED & REPLACED BY LK3 R217, C59 & LINKS 'F' & 'G' DELETED. PARTS LIST CHANGES IL 16.4.80	MD
14	ECO.1050. 1117. 1128 PARTS LIST CHANGES C8 RELOCATED. D68 ADDED. R41/R88 DELETED. IL 2.6.80	MD
15	ECO. 1168. 1144 Q35 Q36 WERE 2N3056 R13. R35. R36. Q2 & Q3 ADDED. IL 24.9.80	MD
16	ECO. 1114. 1182. 1184. 1188 1190. 1191. 1193. 1192 Q35 & Q36 NOW MOUNT ON DIL. SOCKET 605059 R236 & R237 ADDED. WIRE TERMINAL ASSY TO J1-7 WAS FITTED TO J1-8. TRACK FROM WHERE J1-7 WIRE JOINS PCB, CUT ON COMP. SIDE. LK21 ADDED. FURTHER PARTS LIST CHANGES. IL 15.12.80	MD


A
B
C
D
E
EST LINKS
AS TEST POINTS.
WIRE/TERMINAL ASSY 400379/1 7 OFF.
6 OFF CERAMIC BEADS PART No 630036
D39
C42
R198
R199
R200
R201
D40
C43
C44
C45
C46
C47
C48
C49
C50
C51
C52
R202
R203
D52
M33
Q25
Q27
Q29
Q30
Q31
Q32
Q33
Q34
TP32
TP33
D50
D51
D53
D54
D55
D56
D66
D67
C53
C54
C55
R190
R191
R192
R193
R194
R195
R196
R197
R204
R205
R206
R207
R208
R209
R210
CUT TRACK COMP SIDE OF PCB. MAKING A GAP OF 1·50mm
ALL LINKS AND TEST POINTS USE TINNED COPPER WIRE PART No. 540002
NOTE :- FIT E506 AS SHOWN ON DRG FIT TCR506 AS SHOWN WITH FLAT ON THE LEFT.
A
C
Q1
Q4
TCR 506
* NYLATCH - GROMMET 617011 8 OFF
* NYLATCH - PLUNGER 617010 - 8 OFF NB. FIT FROM COMPONENT SIDE OF PCB
SECTION A-A
SLEEVE LEADS OF D68 BEFORE SOLDERING TO UNDERSIDE OF PCB. USE 590004.
FSV TERMINAL PART No 602001 6 OFF
COLOUR DOTS TO BE ON TOP
3mm APPROX.
PCB 410095-5A
LOOP D59 & D60 LEADS AS ABOVE.
MOUNT M39, Q35, Q36 ON 8WAY DIL SOCKET No 605059 - 3 OFF
ENSURE THAT ALL RESISTORS MARKED * ARE MOUNTED 3mm OFF PCB
R120
R121
R122
3mm
Y 400379/2
CLO
PART
LARISED SOCKET
52 - 2 OFF
NOTE ! ALL RELAY WIRES PTFE INSULATED STRIP 5mm FR

TRONICS LTD. NORWICH.

DRAWING SIZE
A1

UE PCB ASSEMBLY

DRAWING No.
400328

SHEET
1 OF 2

1	2	7

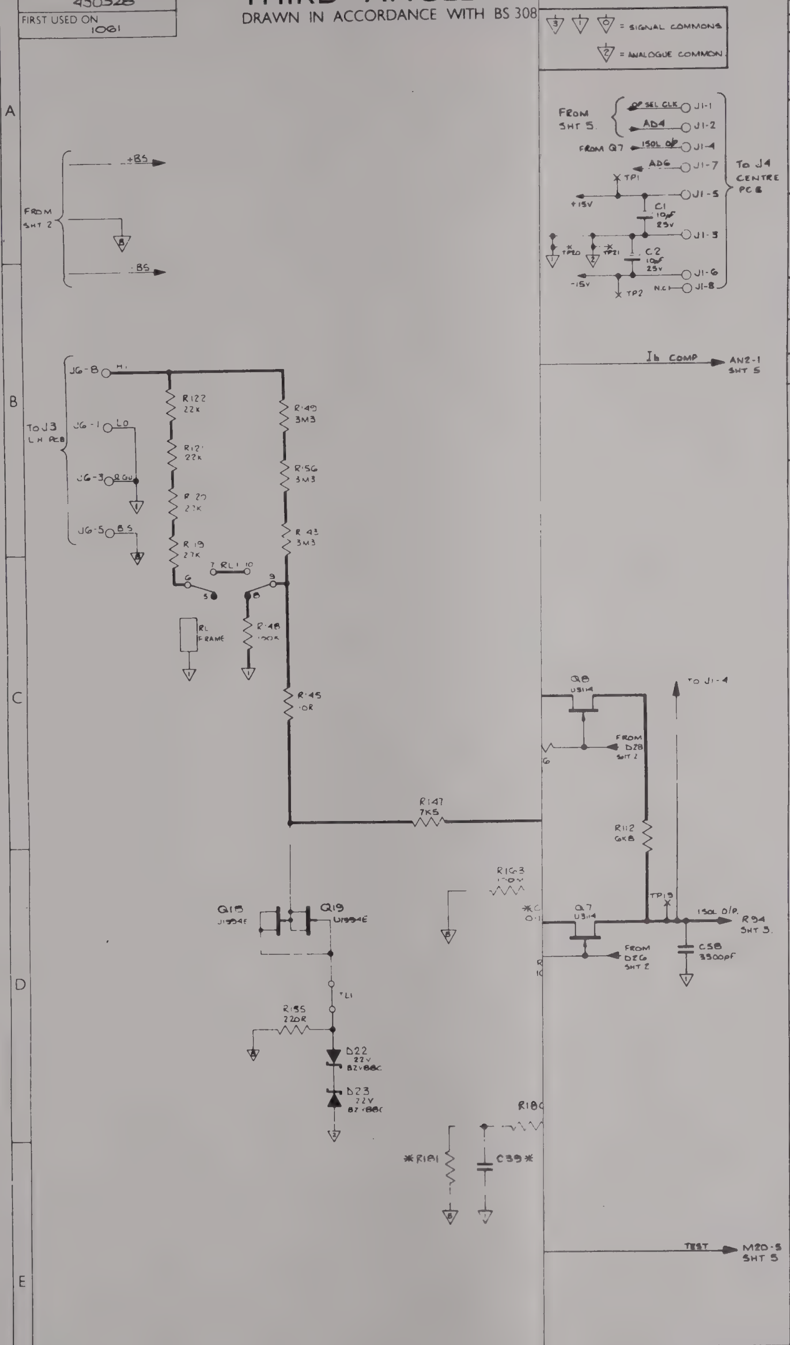
DRAWING No
430328

FIRST USED ON
1061

THIRD ANGLE PR

DRAWN IN ACCORDANCE WITH BS 308

NOTES



3
1
0
= SIGNAL COMMONS
2
= ANALOGUE COMMON
A
B
C
D
E
FROM SHT 2
+BS
8
-BS
FROM SHT 5.
O/P SEL CLK
J1-1
AD4
J1-2
FROM Q7
ISOL O/P
J1-4
AD6
J1-7
TO J4 CENTRE PCB
TP1
+15V
J1-5
C1 10µF 25V
J1-3
TP20
TP21
C2 10µF 25V
J1-6
-15V
TP2
N.C
J1-8
Ib COMP
AN2-1 SHT 5
J6-8
HI
TO J3 LH PCB
J6-1
LO
J6-3
2 GU
J6-5
BS
R122 22K
R121 22K
R120 22K
R119 22K
R149 3M3
R156 3M3
R143 3M3
7 RL1 10
6
5
9
8
RL FRAME
R148 100K
R145 10R
Q8 U314
TO J1-4
FROM D28 SHT 2
R147 7K5
R112 6K8
R163 100K
TP19
Q15 J1994E
Q19 U1994E
Q7 U314
ISOL O/P
R94 SHT 3.
FROM D26 SHT 2
C58 3300pF
TL1
R155 220R
D22 22V BZV88C
D23 22V BZV88C
R180
*R181
C39*
TEST
M20-5 SHT 5

ISS.	CHANGES
3	RE-DRAWN. 19-4-79. ECO 826, 834 & B.J. ECO 883.
4	SEE SHEETS 2 & 3
5	SEE SHEET 5.
6	ECO.959 SEE SHT. 5 JL 20.9.79
7	ECO. 965 M36 WAS µA714. ECO 986 C30 DELETED. B.J. 12-10-79.
8	ECO 985 & 957. BJ R127 WAS 10M (BRIDGE) (SHT 1) R220. 221 & 222 WERE 1M (SHT 4) R219 WAS 1M R57 " 47R C60 ADDED (SHT 3) R227 " 30-10-79
9	ECO.1048. R123 WAS 2M37 1% R125 WAS 2M37 1% R134 WAS 470k R135 WAS 3M92 1% R136 WAS 4M75 1% R138 WAS 1M82 1% JL 27.2.80
10	ECO.1098 R217 & LINK 'G'. DELETED. JL 16.4.80
11	ECO. 1050. 1117. 1128 SEE SHTS 2, 3 & 4. JL 2.6.80
12	ECO.1168 SEE SHEET 3. JL 23.9.80
13	ECO 1184. 1188. 1181. 1190. 1192 J1-8 WAS GU. J1-7 ADDED (AD6). R150 WAS 100k. SEE ALSO SHTS 2 & 5 JL 16.12.80

NORWICH.

DRAWING SIZE
A1

DRAWING No.
430328.

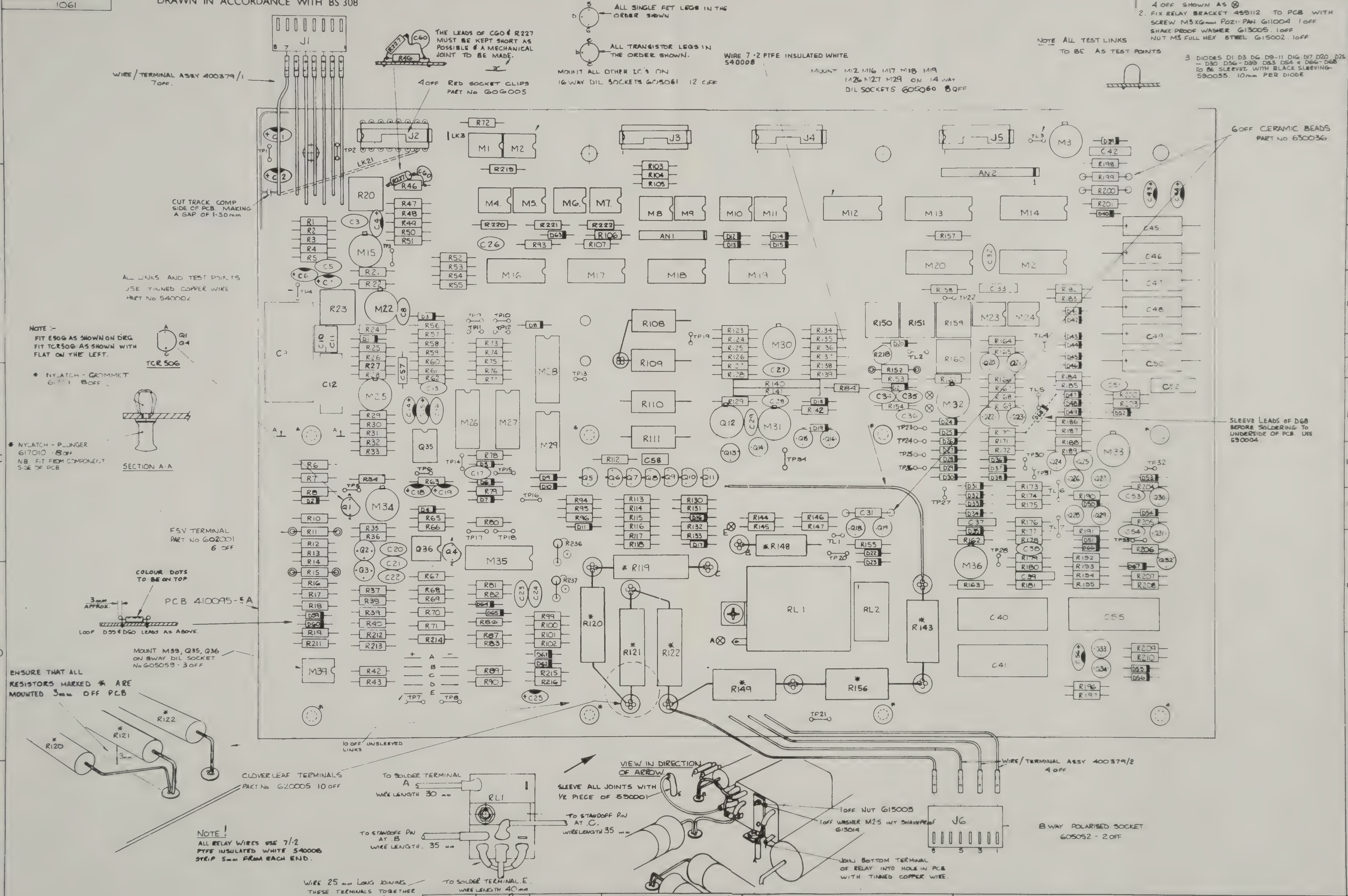
SHEET
1 OF 5

DRAWING No	400328
FIRST USED ON	1061

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED


1
2
3
4
5
6
7
A
B
C
D
E
J1
8 7
WIRE / TERMINAL ASSY 400379/1
7OFF.
THE LEADS OF C60 & R227 MUST BE KEPT SHORT AS POSSIBLE & A MECHANICAL JOINT TO BE MADE.
R227
C60
R46
4OFF RED SOCKET CLIPS PART No 606005
ALL SINGLE FET LEGS IN THE ORDER SHOWN
S
D
G
ALL TRANSISTOR LEGS IN THE ORDER SHOWN.
e
b
c
MOUNT ALL OTHER I.C.'S ON 16 WAY DIL SOCKETS 605061 12 OFF
WIRE 7·2 PTFE INSULATED WHITE 540008
MOUNT M12 M16 M17 M18 M19 M26 M27 M29 ON 14 WAY DIL SOCKETS 605060 8 OFF
NOTE ALL TEST LINKS TO BE AS TEST POINTS
6OFF CERAMIC BEADS PART No 630036
J2
J3
J4
J5
LK3
LK21
M1
M2
M3
AN2
AN1
CUT TRACK COMP SIDE OF PCB. MAKING A GAP OF 1·50mm
ALL LINKS AND TEST POINTS USE TINNED COPPER WIRE PART No 540002
NOTE :-
FIT E506 AS SHOWN ON DRG
FIT TCR506 AS SHOWN WITH FLAT ON THE LEFT.
Q1
Q4
TCR 506
* NYLATCH - GROMMET
8OFF
SECTION A-A
* NYLATCH - PLUNGER 617010 - 8OFF
N.B. FIT FROM COMPONENT SIDE OF PCB
FSV TERMINAL PART No 602001 6 OFF
COLOUR DOTS TO BE ON TOP
3mm APPROX.
PCB 410095-5A
LOOP D59 & D60 LEADS AS ABOVE.
MOUNT M39, Q35, Q36 ON 8WAY DIL SOCKET No 605059 - 3OFF
ENSURE THAT ALL RESISTORS MARKED * ARE MOUNTED 3mm OFF PCB
R120
R121
R122
3mm
SLEEVE LEADS OF D68 BEFORE SOLDERING TO UNDERSIDE OF PCB. USE 590004.
RL1
RL2
R143
R148
R149
R156
R119
10 OFF UNSLEEVED LINKS
CLOVER LEAF TERMINALS PART No 620005 10 OFF
TO SOLDER TERMINAL A
WIRE LENGTH 30 mm
TO STANDOFF PIN AT C.
WIRE LENGTH 35 mm
TO STANDOFF PIN AT B
WIRE LENGTH. 35 mm
TO SOLDER TERMINAL E.
WIRE LENGTH 40 mm
WIRE 25 mm LONG JOINING THESE TERMINALS TOGETHER SLEEVED (AS SHOWN)
NOTE !
ALL RELAY WIRES USE 7/·2 PTFE INSULATED WHITE 540008 STRIP 5mm FROM EACH END.
VIEW IN DIRECTION OF ARROW.
SLEEVE ALL JOINTS WITH ½ PIECE OF 550001
1OFF NUT 615005
1OFF WASHER M2·5 INT SHAKEPROOF 613014
JOIN BOTTOM TERMINAL OF RELAY INTO HOLE IN PCB WITH TINNED COPPER WIRE.
WIRE/TERMINAL ASSY 400379/2 4 OFF
J6
8 5 3 1
8 WAY POLARISED SOCKET 605052 - 2 OFF

NOTES

1. SOLDER PCB TERMINAL LUG PART No 620005. 4 OFF SHOWN AS ⊗
2. FIX RELAY BRACKET 459112 TO PCB WITH SCREW M3X6mm POZI-PAN 611004 1OFF SHAKE PROOF WASHER 613005. 1OFF NUT M3 FULL HEX STEEL 615002. 1OFF
3. DIODES D1 D3 D6. D9-11 D16. D17 D20 D25 - D30 D36 - D39 D53 D54 & D66 - D68 TO BE SLEEVED WITH BLACK SLEEVING 590035. 10mm PER DIODE

ISS.	CHANGES
A	
B	UPDATED PCB.
1	RELEASED TO PRODN 23-11-78
2	R46 WAS 10K (000108) R104 & R105 WAS 270R (000271) M11 WAS 14011 (280008) ECO 801 26 FEB 79 W.A.S
3	COMPONENT VALUES CHANGED REFER TO ECO 826 & ECO 834 4 4 79 IL
4	COMPONENT VALUES CHANGED. REFER TO ECO 853. 23-4-79. BJ
5	D57 REMOVED & PTs. LT CHANGE TO R24 ECO. 886/910/904 IL 19. 6. 79
6	ECO 929 D40 HAS BEEN RE-INSTATED BJ 16-7-79
7	ECO 937 PCB RAISED TO ISS.6A IL 4.9.79
8	ECO. 959 C59 ADDED ACROSS M16-8 & M16-11 IL 20.9.79
9	ECO 963, 972 & 984 C30 REMOVED. CHANGED , R182, R183, C31, C35, M36 & RL1 BJ 12-10-79
10	ECO 967. 985 & 997 RELAY WIRES WERE PVC INSULATED R57 WAS 47R R127 WAS 10M (041006) R219. 220. 221 & 222. WERE 1W. CR25 R227 & C60 ADDED B.J 30-10-79
11	ECO 1000 SOCKET CLIP 606005 WAS 606007 IL 18 1 80
12	ECO 1049 1072 1077 PARTS LIST CHANGES IL 27 2 80
13	ECO. 1098. 1107 CLOVERLEAFS WERE 18 OFF D58 REMOVED & REPLACED BY LK3 R217, C50 & LINKS 'F' & 'G' DELETED PARTS LIST CHANGES IL 16 4 80
14	ECO 1050 1117. 1128 PARTS LIST CHANGES C8 RELOCATED. D68 ADDED. R41/R88 DELETED. IL 2.6 80
15	ECO 1168. 1144 Q35 Q36 WERE 2N3956 R12. R35. R36 Q2 & Q3 ADDED IL 24 9.80
16	ECO 1114 1182 1184 1188 1190 1191 1193 1192 Q35 & Q36 NOW MOUNT ON DIL SOCKET 605059 R236 & R237 ADDED WIRE TERMINAL 400379 TO J1-7 WAS FITTED TO J1-8 TRACK FROM WHERE J1-7 WIRE JOINS PCB, CUT ON COMP SIDE LK21 ADDED FURTHER PARTS LIST CHANGES IL 15 12 80

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	MATERIAL
BJ	DCG	MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 ANGULAR ± °	——
TRACED	APPROVED	SCALE 2:1 NOT TO BE SCALED	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	FINISH ——
DATE 12-7-78	DATE			

datron ELECTRONICS LTD. NORWICH.

TITLE	DRAWING No.	DRAWING SIZE	SHEET
1061 ANALOGUE PCB ASSEMBLY	400328	A1	1 OF 2

DRAWING No	430328
FIRST USED ON	1061

THIRD ANGLE PROJECTION

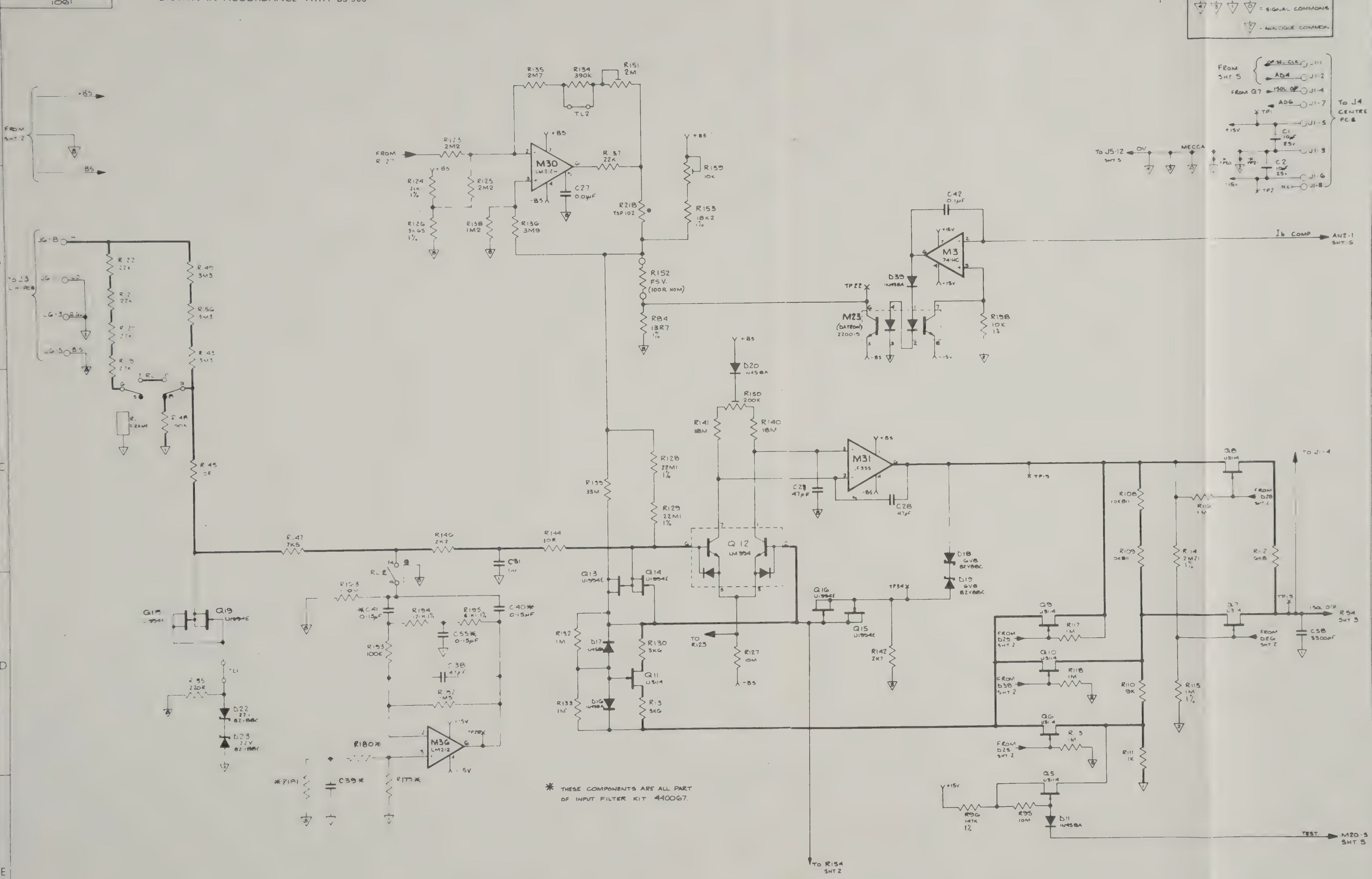
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

= SIGNAL COMMONS

= ANALOGUE COMMON



FROM SHT 2
+BS
BS
FROM R 27
R123 2M2
R124
R125 2M2
R126
R138 1M2
R136 3M9
R135 2M7
R134 390k
R151 2M
TL2
M30
R37 22K
C27 0.0μF
R218
R159 10k
R153 18K2 1%
R152 F.S.V. (100R NOM)
R84 18R7 1%
J6-B
TO J3
R22 22k
R49 3M3
R56 3M3
R43 3M3
R45
R47 7K5
R146 2K7
R144 10R
C81
R153
C41 0.15μF
R194
R195
C40 0.15μF
C55 0.15μF
C38
R193 100K
R92
M36 LM212
R180
R179
C39
Q18
Q19 U1994E
R55 220R
D22
D23
Q13 U1994E
Q14 U1994E
Q12 LM394
Q16 U1994E
Q15 U1994E
R132 1M
D17
D16
R133 1M
R130 3K6
Q11 U3114
R13 3K6
TO R125
R127 10M
R142 2K7
R135 33M
R128 22M1 1%
R129 22M1 1%
D20 1N458A
R150 200K
R141 18M
R140 18M
M31 LF355
C29 47pF
C28 47pF
TP13
D18 6V8 BZY88C
D19 6V8 BZY88C
TP34
C42 0.1μF
M3 741HC
D39 1N458A
TP22
M23 (DATRON) 2200-5
R158 10K 1%
Ib COMP
AN2-1 SHT 5
TO J5-12 SHT 5
MECCA
FROM SHT 5
FROM Q7
TO J4 CENTRE PCB
J1-1
J1-2
J1-4
J1-7
J1-5
J1-3
J1-6
J1-8
ADG
ISOL O/P
TP1
TP2
C1
C2
Q8 U3114
FROM D28 SHT 2
TO J1-4
R108
R109
R114 2M21 1%
R2
Q9 U3114
R117 1M
FROM D29 SHT 2
Q10 U3114
R118 1M
FROM D38 SHT 2
Q7 U3114
FROM D26 SHT 2
ISOL O/P
R54 SHT 3
C58 3300pF
R110 9K
R115 1M 1%
Q6 U3114
FROM D25 SHT 2
R111 1K
Q5 U3114
R96 1%
R95 10M
D11 1N458A
TEST
M20-5 SHT 5
TO R154 SHT 2

* THESE COMPONENTS ARE ALL PART OF INPUT FILTER KIT 440067.

ISS.	CHANGES
3	RE-DRAWN 13-4-79 ECO 826, 834 & BJ ECO 853
4	SEE SHEETS 2 & 3
5	SEE SHEET 5
6	ECO 959 SEE SHT. 5 20.9.79
7	ECO 963 M36 WAS μA714. ECO 986 C20 DELETED. BJ 12-10-79
8	ECO 985 & 987 BJ R127 WAS 10M (SHT 1) R220. 221 & 222 WERE 1M (SHT 4) R219 WAS 1M R57 " 47R C60 ADDED (SHT 3) R227 " 30-10-79
9	ECO 1046 R123 WAS 2M87 1% R125 WAS 2M87 1% R134 WAS 470k R135 WAS 3M92 1% R136 WAS 4M75 1% R138 WAS 1M82 1% 27.2.80
10	ECO 1098 R217 & LINK 'G' DELETED 16 4 80
11	ECO. 1050. 1117. 1128 SEE SHTS 2, 3 & 4 2.6.80
12	ECO 1168 SEE SHEET 3. 23 9 80
13	ECO 1184 1188 1181 1190 1192 J1-8 WAS Gu J1-7 ADDED (ADG) R150 WAS 100k SEE ALSO SHTS 2 & 5 16 12 80

DRAWN BJ	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ° INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL ———	datron ELECTRONICS LTD. NORWICH.
TRACED	APPROVED	SCALE		FINISH ———	TITLE DC ISOLATOR 1061
DATE 9-4-79	DATE	NOT TO BE SCALED			

DRAWING SIZE	DRAWING No.	SHEET
A1	430328	1 OF 5

1	2	7

A

B

C

D

E

DRAWING No.
430328

FIRST USED ON
1061.

THIRD ANGLE

DRAWN IN ACCORDANCE WITH

NOTES

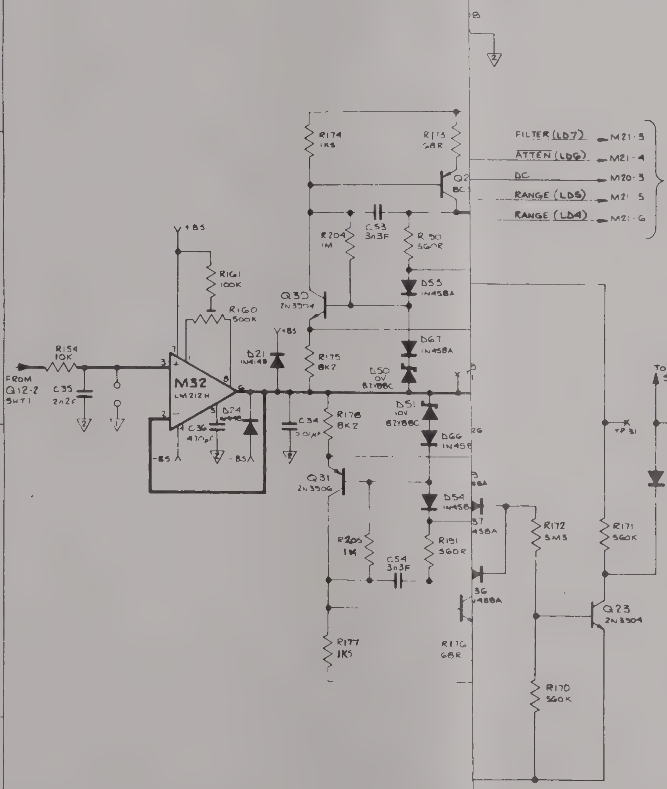
RANGE	FET CONTROL LINE. TP 23	TP 24	TP 25	TP 26	TP 27
100 mv	1	0	1	0	0
1 v	0	0	1	0	1
10V	0	1	0	1	0
100 V	0	0	1	0	1
1000V	0	1	0	1	0
$\overline{\text{DC}}$	0	0	0	1	0

LOGIC '1' = FET ON
" '0' = FET OFF

RANGE	INPUT CONTROL LINE. LD7	LD6	LD5	LD4
100mV	X	1	1	0
1v	X	1	1	1
10V	X	1	0	1
100V	X	0	1	1
1000V	X	0	0	1
$\overline{\text{DC}}$	1	0	0	0
FILTER	1	X	X	X

LOGIC 1 ≡ 0V
" 0 ≡ -15V

ISS.	CHANGES	
3	RE-DRAWN 19-4-79 ECO 826, 834 & B.J. ECO 853.	MD
4	D57 DELETED. IL ECO. 886 20.6.79	MD
5	SEE SHEET 5.	MD
6	SEE SHEET 3	MD
7	ECO 963. R182 & 183 WERE 10K. BJ 12-10-79.	MD
8	ECO 989 & 997. B.J. SEE SHEET 1. 30-10-79	MD
9	ECO.1072 C51 WAS 2n2F C53 C54 WERE 10nF IL 27.2.80	MD
10	SEE SHEETS 1,3 & 5 IL 16.4.80	MD
11	ECO. 1117 D68 ADDED. IL 2.6.80	MD
12	SEE SHEET 3	MD
13	SEE SHEETS 1,3 & 4.	MD


B
2
FILTER (LD7) M21·3
$\overline{\text{ATTEN}}$ (LD6) M21·4
DC M20·3
RANGE (LD5) M21 5
RANGE (LD4) M21·6
To SHT 5
R174
1K5
R173
68R
Q2
BC
R204
1M
C53
3n3F
R 50
560R
+85
R161
100K
R160
500K
Q30
2N3904
D53
1N458A
D67
1N458A
+85
D21
1N4148
R175
8K2
D50
0V
BZY88C
R154
10K
FROM
Q12·2
SHT 1
C35
2n2F
2
1
3
+
7
1
M32
LM212H
8
6
2
−
4
5
C36
470pF
D24
1N4148
−85
2
−85
C34
0.01µF
2
R178
8K2
D51
10V
BZY88C
D66
1N458
26
Q31
2N3906
D54
1N458
37
458A
R205
1M
C54
3n3F
R191
560R
36
458A
R177
1K5
R176
68R
R172
3M3
R171
560K
R170
560K
Q23
2N3904
To Q6
SHT 1
TP 31
TP 23
D25
1N458A

LTD. NORWICH.

DRAWING SIZE
A1

DRAWING No.
430328.

SHEET
2 OF 5

1061

DRAWING No.
430328
FIRST USED ON
1061

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

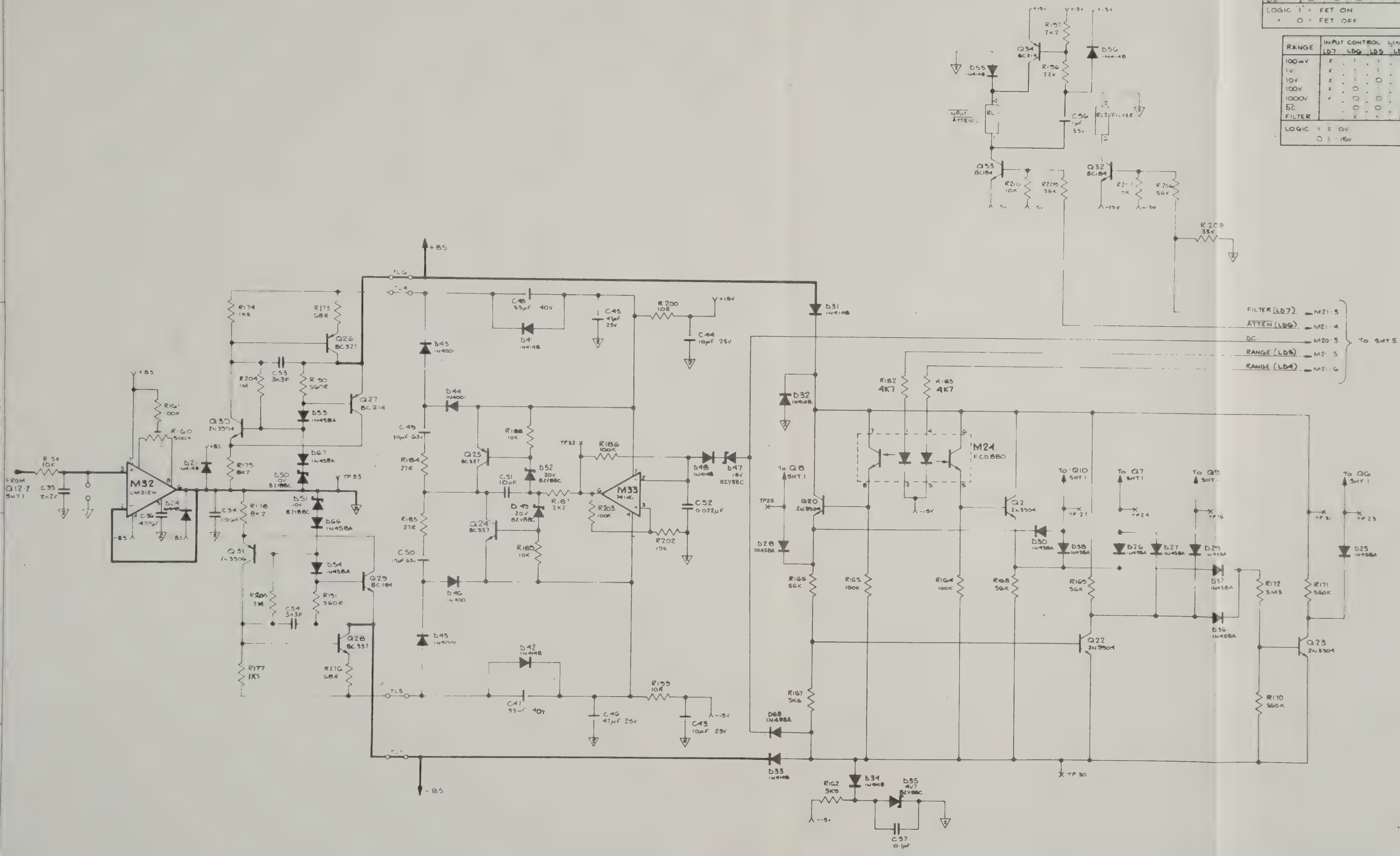
RANGE	FET CONTROL LINE TP 23	TP 24	TP 25	TP 26	TP 27
100 mV	1	0	1	0	0
1V	0	0	1	0	1
10V	0	1	0	1	0
100V	0	0	1	0	1
1000V	0	1	0	1	0
$\overline{\text{DC}}$	0	0	0		0

LOGIC '1' = FET ON
" 0 = FET OFF

RANGE	INPUT CONTROL LINE LD7	LD6	LD5	LD4
100mV	X	1	1	0
1V	X	1	1	1
10V	X	1	0	1
100V	X	0	1	1
1000V	X	0	0	1
$\overline{\text{DC}}$		0	0	0
FILTER		X	X	X

LOGIC 1 ≡ 0V
0 ≡ -16V

ISS.	CHANGES	
3	RE-DRAWN 13-4-79 ECO 826, 834 & B J ECO 833	MD
4	D57 DELETED IL ECO 886 20.6 79	MD
5	SEE SHEET 5	MD
6	SEE SHEET 3	MD
7	ECO 963. R182 & 183 WERE 10K B J 12-10-79	MD
8	ECO 985 & 957 B.J SEE SHEET 1 30-10-79	MD
9	ECO 1072 C51 WAS 2n2F C53 C54 WERE 10nF IL 27.2.80	MD
10	SEE SHEETS 1,3 & 5 IL 16.4 80	MD
11	ECO 1117 D68 ADDED IL 2.6.80	MD
12	SEE SHEET 3	MD
13	SEE SHEETS 1,3 & 4	MD


FROM Q12·2 SHT 1
R54 10K
C35 2n2F
M32 LM212H
R161 100K
R160 500K
+B5
-B5
D21 IN4148
C36 470pF
D24 IN4148
C34 0·01µF
R174 1K5
R173 68R
Q26 BC327
R204 1M
C53 3n3F
R190 560R
Q27 BC214
Q30 2N3904
D53 IN458A
D67 IN458A
D50 10V BZY88C
R175 8K2
TP33
D51 10V BZY88C
D66 IN458A
R178 8K2
Q31 2N3906
D54 IN458A
Q29 BC184
R205 1M
C54 3n3F
R191 560R
Q28 BC337
R177 1K5
R176 68R
TL6
TL4
TL5
TL7
+B5
-B5
C48 33µF 40V
D41 IN4148
C45 47µF 25V
R200 10R
+15V
C44 10µF 25V
D43 IN4001
D44 IN4001
C49 10µF 63V
R184 27R
R188 10K
Q25 BC327
D52 20V BZY88C
C51 10nF
TP32
R186 100K
M33 741HC
R187 2K2
D49 20V BZY88C
R203 100K
R202 10K
C52 0·022µF
D48 IN4148
D47 18V BZY88C
R185 27R
Q24 BC337
R189 10K
C50 10µF 63V
D46 IN4001
D45 IN4001
D42 IN4148
C47 33µF 40V
C46 47µF 25V
R199 10R
C43 10µF 25V
-15V
D31 IN4148
D32 IN4148
To Q8 SHT 1
TP25
Q20 2N3904
D28 IN458A
R166 56K
R167 5K6
D68 IN458A
D33 IN4148
R182 4K7
R183 4K7
M24 FCD880
-15V
R165 100K
R164 100K
Q21 2N3904
R168 56K
To Q10 SHT 1
TP27
To Q7 SHT 1
TP24
To Q9 SHT 1
TP26
D30 IN458A
D38 IN458A
D26 IN458A
D27 IN458A
D29 IN458A
D37 IN458A
D36 IN458A
R169 56K
Q22 2N3904
R172 5M3
R170 560K
R171 560K
Q23 2N3304
To Q6 SHT 1
TP31
TP23
D25 IN458A
TP30
R162 3K9
D34 IN4148
D35 4V7 BZY88C
C37 0·1µF
FILTER (LD7) M21·3
$\overline{\text{ATTEN}}$ (LD6) M21·4
DC M20·3
RANGE (LD5) M21·5
RANGE (LD4) M21·6
To SHT 5
+15V
Q34 BC214
R197 2K2
D56 IN4148
D55 IN4148
R196 22K
$\overline{\text{INPUT ATTEN}}$
RL1
C56 1µF 35V
RL2 FILTER
Q33 BC184
R210 10K
R209 56K
Q32 BC184
R207 10K
R206 56K
-15V
R208 33K

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	MATERIAL
B J		MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 ANGULAR ± °	—
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	FINISH
DATE 17-4-79	DATE	NOT TO BE SCALED		—

datron ELECTRONICS LTD. NORWICH.

TITLE

Boot strapped supplies & range logic 1081

DRAWING SIZE	DRAWING No.	SHEET
A1	430328.	2 OF 5

1 | 2 | 7

DRAWING No
430328

FIRST USED ON
1061

THIRD ANGLE PRC

DRAWN IN ACCORDANCE WITH BS 308

NOTES

ISS.	CHANGES
3	RE DRAWN 19-4-79 ECO 826, 834 & BJ ECO 855
4	R24 WAS 820k IL ECO 910 20.6.79
5	SEE SHEET 5.
6	SEE SHEET 5
7	SEE SHEET & 2
8	ECO 989 & 997. BJ SEE SHT 1 30-10-79
9	SEE SHEETS 1 & 2
10	ECO 1098 Q35 Q36 WERE SU2656M R46 WAS 1k5 D58 DELETED & REPLACED WITH LK3. IL 16.4.80
11	ECO. 1050 R58 WAS 1k C8 WAS ACROSS R24. C11 WAS 1nF. C57 WAS 68pF M22 WAS LF356H. IL 2.6.80
12	Q35 & Q35 WERE 2N3956 R4 WAS 10M R5 WAS 18k R12 & R14 WERE 5K6 R13 & R35 WERE ADDED. R36 R24 WAS 680k C12 WAS 0·47µF Q2 & Q3 ADDED LK1 & LK2 REMOVED. IL 25 9.80
13	R236 & R237 ADDED R57 WAS 200R IL 16.12.80

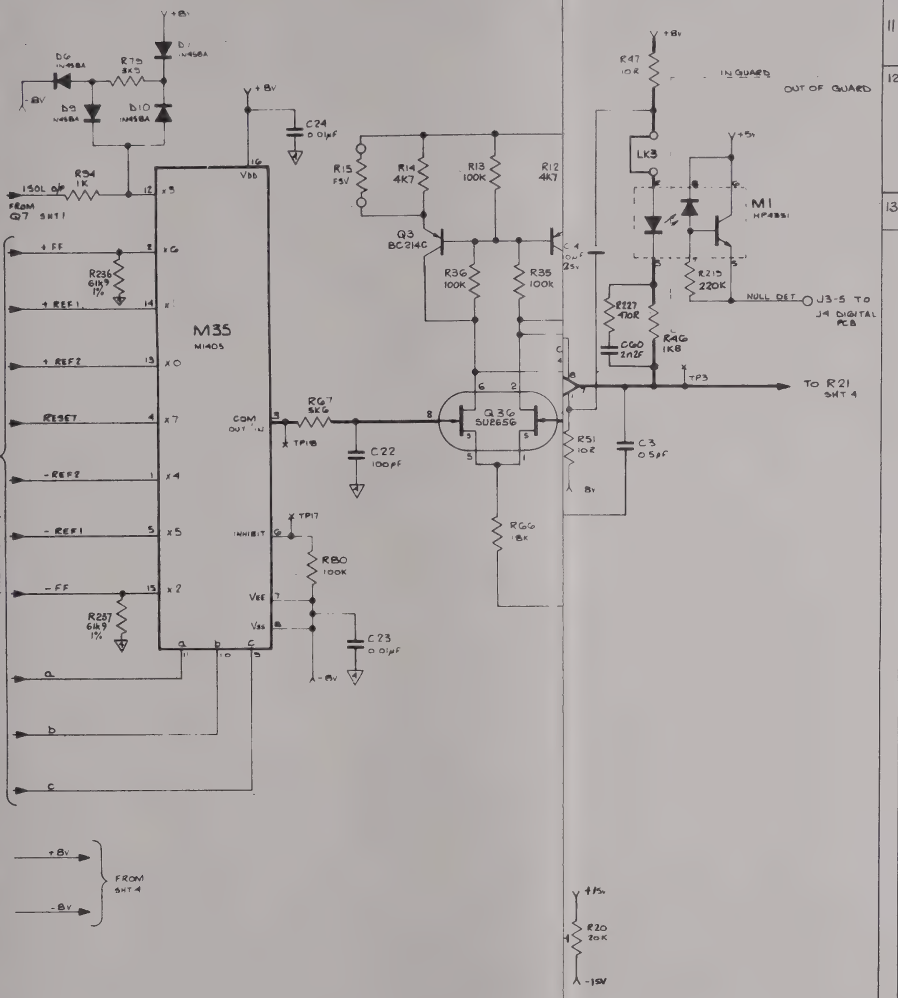
A

B

C

D

E


+8v
D7 1N458A
D6 1N458A
R79 3K9
-8v
D9 N458A
D10 1N458A
+8v
C24 0.01µF
ISOL o/p
R94 1K
FROM Q7 SHT1
+FF
R236 61k9 1%
+REF1
+REF2
RESET
-REF2
-REF1
-FF
R237 61k9 1%
FROM SHT 4
a
b
c
M35 M1405
VDD
x3
x6
x1
x0
x7
x4
x5
x2
COM OUT/IN
INHIBIT
VEE
VSS
16
12
2
14
13
4
1
5
15
3
6
7
8
11
10
9
RG7 5K6
TP18
C22 100pF
TP17
R80 100K
C23 0.01µF
-8v
R15 F.S.V.
R14 4K7
R13 100K
R12 4K7
Q3 BC214C
R36 100K
R35 100K
C4 10µF 25v
Q36 SU2656
RG6 18K
R51 10R
8v
C3 0.5pF
R47 10R
+8v
IN GUARD
OUT OF GUARD
LK3
+5v
M1 HP4351
R215 220K
NULL DET
J3-5 TO J4 DIGITAL PCB
R227 470R
CG0 2n2F
R46 1K8
TP3
TO R21 SHT 4
+8v
-8v
FROM SHT 4
+15v
R20 20K
-15v

CONDITION	MULTIPLEXER			RESET
	a	b	c	
RESET	1	1	1	1
SIG	1	1	0	0
-Ve BIAS.	0	1	0	0
+Ve REF 1.	1	0	0	0
+Ve REF 2	0	0	0	0
+Ve BIAS	0	1	1	0
-Ve REF 1	1	0	[illegible]	0
-Ve REF 2	0	0	1	0

DR

LTD. NORWICH.

DRAW

DRAWING No
430328

FIRST USED ON
1061

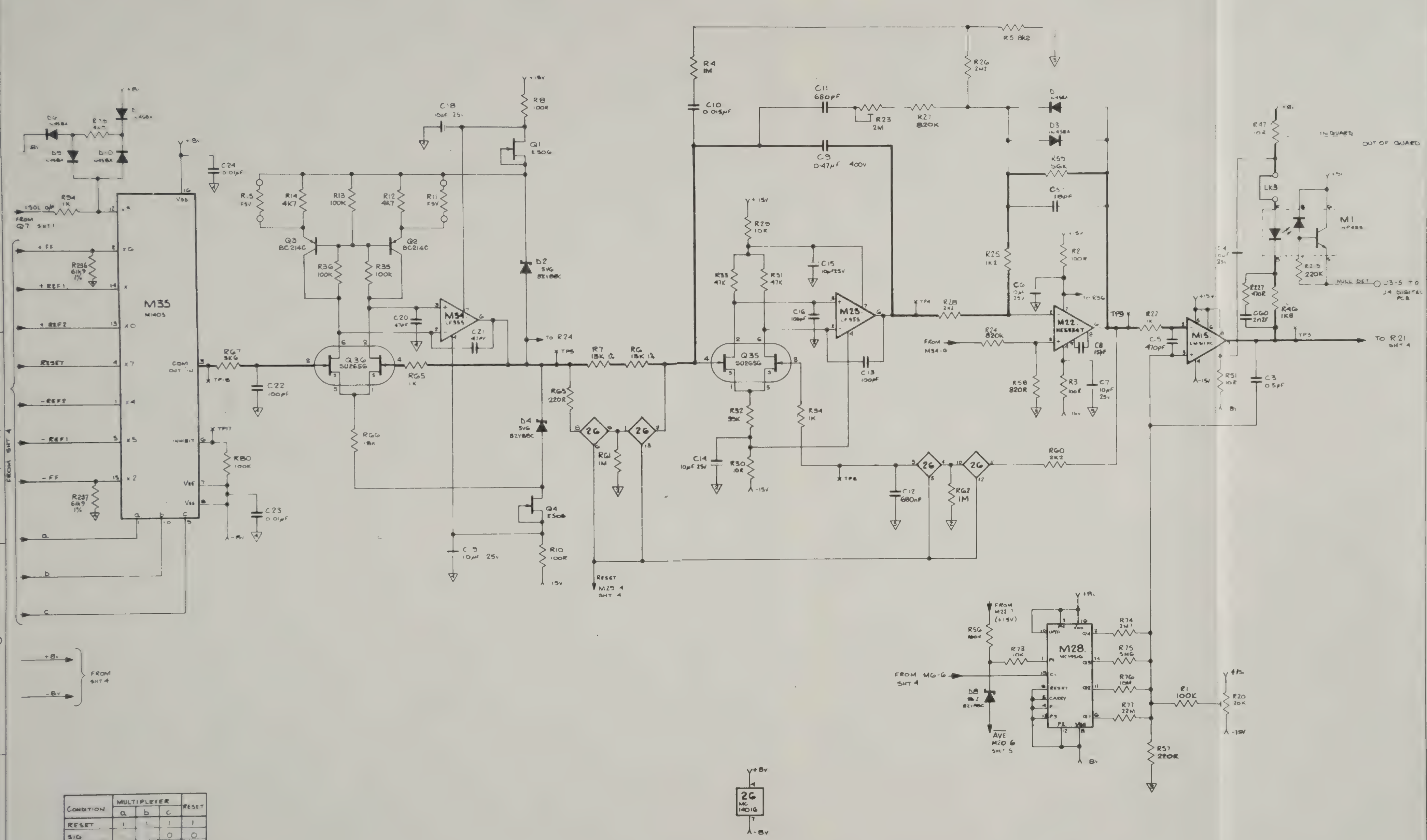
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
3	RE DRAWN 19 4-79 ECO 826, 834 & BJ ECO 855
4	R24 WAS 820k ECO 910 20.6.79
5	SEE SHEET 5
6	SEE SHEET 5
7	SEE SHEET #2
8	ECO 989 & 997. BJ SEE SHT 1 30-10-79
9	SEE SHEETS 1 + 2
10	ECO 1098 Q35 Q36 WERE SU2656M R46 WAS 1K5 D58 DELETED & REPLACED WITH LK3 16.4 80
11	ECO 1050 R58 WAS 1k C8 WAS ACROSS R24 C11 WAS 1nF C57 WAS 68pF M22 WAS LF356H 2.6.80
12	Q35 + Q35 WERE 2N3956 R4 WAS 10M R5 WAS 18k R12 + R14 WERE 5K6 R13 + R35 WERE ADDED. R36 R24 WAS 680k C12 WAS 0.47µF Q2 + Q3 ADDED LK1 + LK2 REMOVED 25 9 80
13	R236 + R237 ADDED R57 WAS 200R 16 12 80


1
2
3
4
5
6
7
A
B
C
D
E
+8v
D6 1N4381
R75 5K6
D 1N4381
D5 1N4381
D10 1N4381
R54 1K
130L 0/P
FROM Q7 SHT 1
+FF
R236 61k9 1%
+REF 1
+REF 2
RESET
-REF 2
-REF 1
-FF
R237 61k9 1%
FROM SHT 4
a
b
c
M35
MI405
VDD
COM OUT
INHIBIT
VEE
VSS
TP18
TP17
R67 5K6
C22 100pF
R80 100K
C24 0.01µF
C23 0.01µF
-8v
R5 F5V
R14 4K7
R13 100K
R12 4K7
R11 F5V
Q3 BC214C
Q2 BC214C
R36 100K
R35 100K
C20 47pF
M34 LF355
C21 47pF
C18 10µF 25v
R8 100R
Q1 E506
+15v
D2 5V6 BZY88C
Q36 SU2656
R65 1K
R66 18K
R63 220R
D4 5V6 BZY88C
Q4 E506
R10 100R
-15v
C9 10µF 25v
TO R24
TP5
R7 13K 1%
R6 13K 1%
26
R61 1M
RESET M25 4 SHT 4
R4 1M
C10 0.015µF
C11 680pF
R23 2M
R27 820K
C5 0.47µF 400v
R26 2M7
R5 8K2
R29 10R
C15 10µF 25v
R33 47K
R31 47K
C16 100pF
M25 LF355
Q35 SU2656
R32 39K
R34 1K
C14 10µF 25v
R30 10R
C13 100pF
TP4
R28 2K2
TP6
C12 680nF
R62 1M
R60 2K2
D 1N4381
D3 1N4381
R59 56K
C57 18pF
R25 1K2
C6 10µF 25v
R2 10R
M22 NE5534T
C8 15pF
R24 820k
FROM M34-6
R58 820R
R3 10R
C7 10µF 25v
TO R56
TP9
R22 1K
C5 470pF
M15 LM301AC
C4 10µF 25v
R51 10R
C3 0.5pF
R227 470R
C60 2n2F
R47 10R
LK3
R46 1K8
R215 220K
M1 HP4N35
IN GUARD
OUT OF GUARD
NULL DET
J3-5 TO J4 DIGITAL PCB
TP3
TO R21 SHT 4
FROM M22 (+15V)
R56 680R
R73 10K
D8 6V2 BZY88C
FROM M6-6 SHT 4
AVE M20 6 SH'T 5
M28
MC14516
R74 2M7
R75 5M6
R76 10M
R77 22M
R1 100K
R20 20K
R57 220R
+8v
-8v
MC 14016
FROM SHT 4

CONDITION	MULTIPLEXER			RESET
	a	b	c	
RESET	1	1	1	1
SIG			0	0
-Ve BIAS	0		0	0
+Ve REF 1	1	0	0	0
+Ve REF 2	0	0	0	0
+Ve BIAS	0			0
-Ve REF 1		0		0
-Ve REF 2	0	0		0

DRAWN B J	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ° INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL ———
TRACED	APPROVED	SCALE		FINISH ———
DATE 11-4-79	DATE	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

TITLE
A-D CONVERTOR 1071

DRAWN

DRAWING No
430328
FIRST USED ON 1061

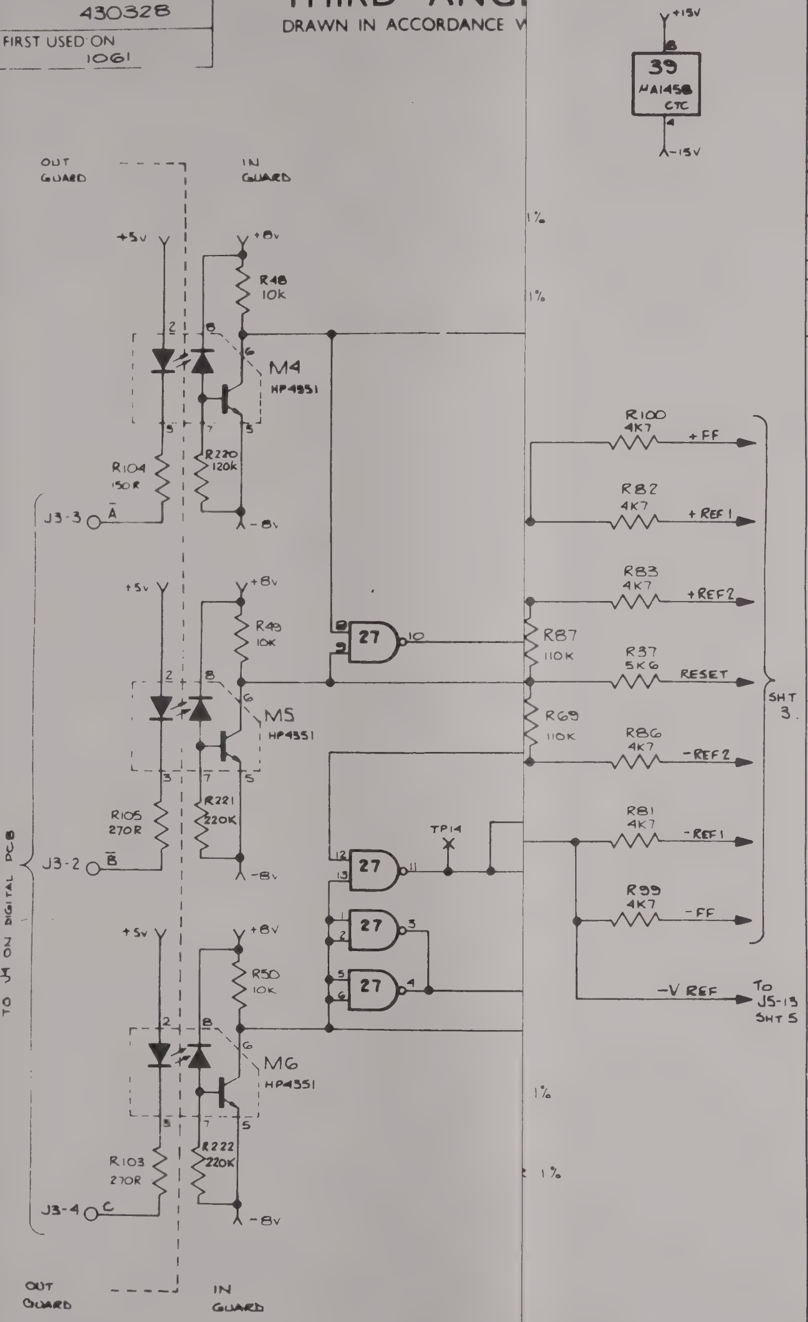
1 2 6

THIRD ANGI

DRAWN IN ACCORDANCE W

NOTES

ISS.	CHANGES
3	RE-DRAWN B J. 19-4-79 ECO826 834 & ECO853.
4	SEE SHEETS 2 & 3.
5	SEE SHEET 5.
6	SEE SHEET 5
7	SEE SHEET 1 & 2
8	ECO 989 & 987. SEE SHT 1. BJ. 30-10-79
9	SEE SHEETS 1 & 2
10	SEE SHEETS 1 3 & 5 IL 16.4.80
11	ECO.1128 R41 & R88 DELETED IL 9.6.80
12	SEE SHEET 3
13	R48 WAS 5k6 R105 WAS 150R R220 WAS 220k IL 16.12.80


+15V
8
39
MA1458
CTC
4
-15V
A
B
C
D
OUT GUARD
IN GUARD
+5v
+8v
R48
10k
2
8
6
M4
HP4351
5
7
5
R104
150R
R220
120k
J3-3
Ā
-8v
1%
1%
R100
4K7
+FF
R82
4K7
+REF1
R83
4K7
+REF2
+5v
+8v
R49
10K
9
27
10
R87
110K
R37
5K6
RESET
M5
HP4351
2
8
6
3
7
5
R69
110K
R86
4K7
-REF2
SHT 3.
R105
270R
R221
220K
J3-2
B̄
-8v
TP14
12
27
11
13
R81
4K7
-REF1
R99
4K7
-FF
1
27
3
2
+5v
+8v
R50
10K
5
27
4
6
-V REF
To J5-13 SHT 5
TO J4 ON DIGITAL PCB
2
8
6
M6
HP4351
3
7
5
1%
R103
270R
R222
220K
1%
J3-4
C
-8v
OUT GUARD
IN GUARD

DRAWN B J	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES ± DECIMAL TO 2 PLACES ± FRACTIONAL ± METRIC DIMENSIONS DECIMAL TO 2 PLACES ± DECIMAL TO 1 PLACE ± WHOLE DIMENSIONS ± UNLESS OTHERWISE STATED
TRACED	APPROVED	SCALE NOT TO BE SCALED	
DATE 6-4-79.	DATE		

WICH.

DRAWING SIZE	
A2	
DRAWING No. 430328	SHEET 4 OF 5

DRAWING No
430328
FIRST USED ON 1061

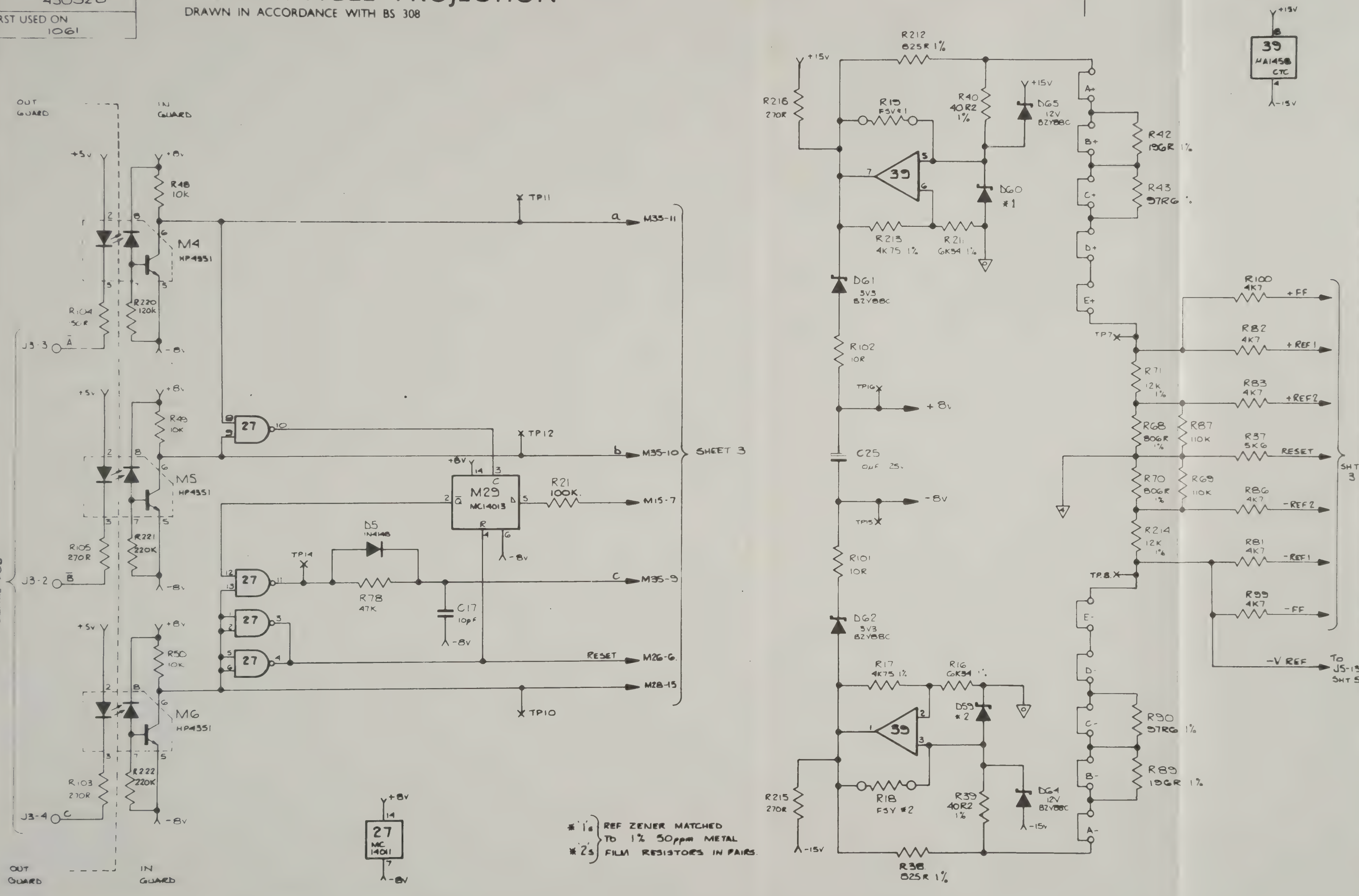
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
3	RE-DRAWN B J 19-4-79 ECO 826 834 & ECO 853
4	SEE SHEETS 2 & 3.
5	SEE SHEET 5.
6	SEE SHEET 5
7	SEE SHEET 1 & 2
8	ECO 985 & 987. SEE SHT 1. BJ. 30-10-79
9	SEE SHEETS 1 & 2
10	SEE SHEETS 1 3 + 5 IL 16.4.80
11	ECO 1128 R41 + R88 DELETED IL 9.6.80
12	SEE SHEET 3
13	R48 WAS 5k6 R105 WAS 150R R220 WAS 220k IL 16.12.80


1
2
3
4
5
6
A
B
C
D
OUT GUARD
IN GUARD
+5v
+8v
-8v
R48 10K
R49 10K
R50 10K
M4 HP4351
M5 HP4351
M6 HP4351
R104 50R
R105 270R
R103 270R
R220 120k
R221 220K
R222 220K
J3-3 Ā
J3-2 B̄
J3-4 C
TO J4 ON DIGITAL PCB
TP11
TP12
TP14
TP10
a M35-11
b M35-10
c M35-9
M15-7
RESET M26-6
M28-15
SHEET 3
27
M29 MC14013
R21 100K
D5 1N4148
R78 47K
C17 10pF
27 MC 14011
+15v
-15v
R212 825R 1%
R216 270R
R15 F5Y#1
R40 40R2 1%
DG5 12V BZY88C
39
DG0 *1
R213 4K75 1%
R211 6K34 1%
DG1 5V3 BZY88C
R102 10R
TP16
+8v
C25 0μF 25v
-8v
TP15
R101 10R
DG2 5V3 BZY88C
R17 4K75 1%
R16 6K34 1%
D59 *2
R18 F5Y #2
R39 40R2 1%
DG4 12V BZY88C
R215 270R
R38 825R 1%
A+
B+
C+
D+
E+
E-
D-
C-
B-
A-
R42 196R 1%
R43 97R6 1%
R90 97R6 1%
R89 196R 1%
TP7
TP8
R71 12K 1%
R68 806R 1%
R70 806R 1%
R214 12K 1%
R87 110K
R69 110K
R100 4K7 +FF
R82 4K7 +REF 1
R83 4K7 +REF 2
R37 5K6 RESET
R86 4K7 -REF 2
R81 4K7 -REF 1
R99 4K7 -FF
SHT 3.
-V REF
TO J5-13 SHT 5
39 μA1458 CTC

*'1's REF ZENER MATCHED
*'2's TO 1% 50ppm METAL FILM RESISTORS IN PAIRS.

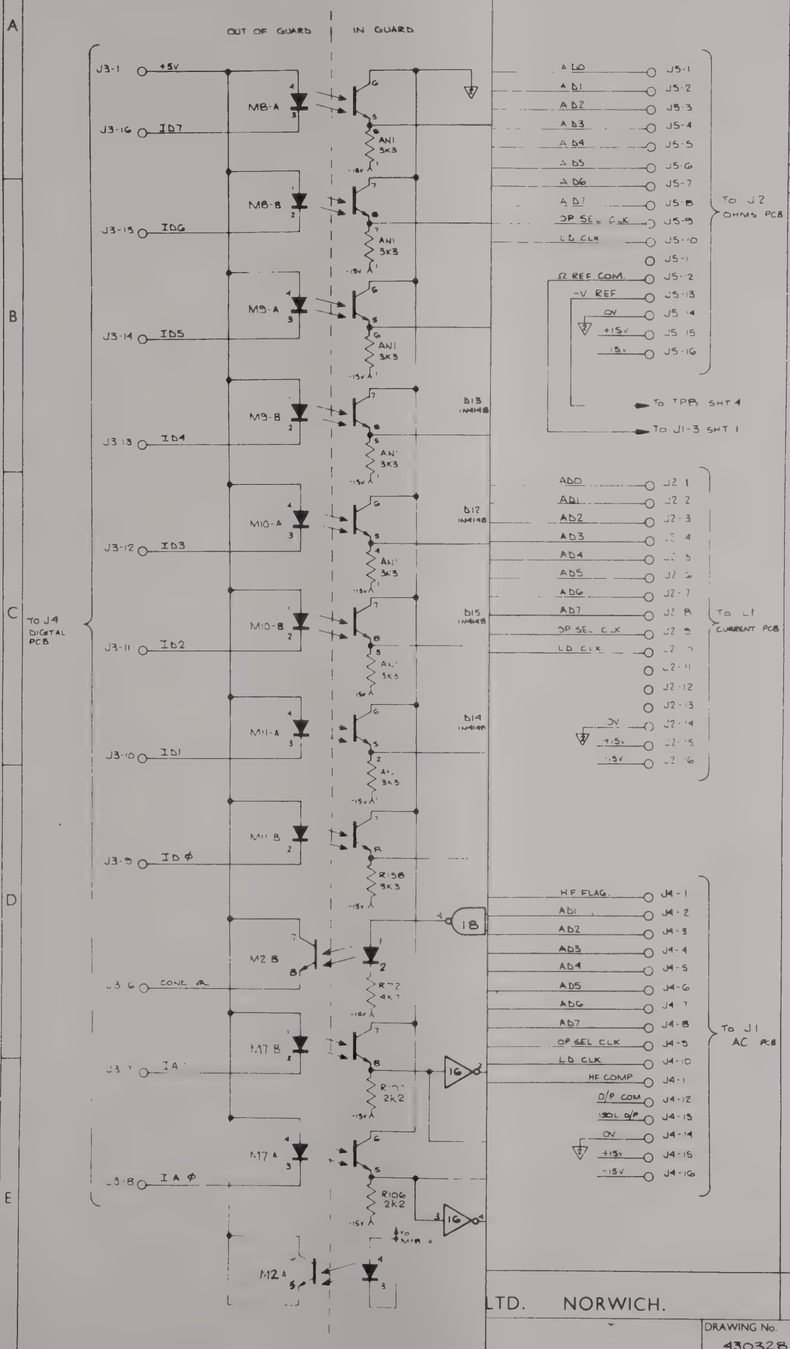
DRAWN B J	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ½° INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL	
TRACED	APPROVED	SCALE NOT TO BE SCALED		FINISH	
DATE 6-4-79	DATE				

datron ELECTRONICS LTD. NORWICH.

TITLE	DRAWING No.	DRAWING SIZE	SHEET
A-D CONTROL & REFERENCES. 1061	430328	A2	4 OF 5

1	2	7
DRAWING No 430328 USED ON 1061	THIRD ANGLE DRAWN IN ACCORDANCE WITH	NOTES

ISS.	CHANGES	
3	RE-DRAWN. 19-4-79 ECO 826, 834 & B.J ECO 858	MD
4	SEE SHEETS 2+3	MD
5.	ECO 929. D40 HAS BEEN RE-INSTATED. B.J. 16-7-79	MD
6	ECO.959 C59 ADDED ACROSS M16-8 + M16-11 IL 20.9.79	MD
7	SEE SHEET 1 & 2.	MD
8	ECO 989 & 997. B.J SEE SHEET 1. 30-10-79	MD
9	SEE SHEETS 1+2	MD
10	ECO.1098. 1107 LINK 'F' DELETED M16 WAS 14069 C59 DELETED C26 WAS 1nF R93 WAS 100k R106/R107 WERE 3k3 IL 17.4 80	MC
11	SEE SHEETS 2+3	MC
12	SEE SHEET 3	
13	SEE SHEETS 1,3+4	



A
B
C
D
E
OUT OF GUARD
IN GUARD
J3-1
+5V
J3-16
ID7
M8-A
AN1 3K3
-15V
J3-15
ID6
M8-B
J3-14
ID5
M9-A
J3-13
ID4
M9-B
J3-12
ID3
M10-A
J3-11
ID2
M10-B
J3-10
ID1
M11-A
J3-9
ID Ø
M11 B
R138 3K3
M2 B
J3-6
CONC A
R72 4K7
M7 B
J3-7
IA
R107 2K2
M7 A
J3-8
IA Ø
R106 2K2
M2 A
TO M18 4
TO J4 DIGITAL PCB
18
16
D13 1N4148
D12 1N4148
D15 1N4148
D14 1N4148
A D0
A D1
A D2
A D3
A D4
A D5
A D6
A D7
OP SEL CLK
LD CLK
Ω REF COM.
-V REF
0V
+15V
-15V
J5-1
J5-2
J5-3
J5-4
J5-5
J5-6
J5-7
J5-8
J5-9
J5-10
J5-11
J5-12
J5-13
J5-14
J5-15
J5-16
TO J2 OHMS PCB
TO TPB SHT 4
TO J1-3 SHT 1
J2-1
J2-2
J2-3
J2-4
J2-5
J2-6
J2-7
J2-8
J2-9
J2-10
J2-11
J2-12
J2-13
J2-14
J2-15
J2-16
TO J1 CURRENT PCB
HF FLAG
HF COMP
O/P COM
ISOL O/P
J4-1
J4-2
J4-3
J4-4
J4-5
J4-6
J4-7
J4-8
J4-9
J4-10
J4-11
J4-12
J4-13
J4-14
J4-15
J4-16
TO J1 AC PCB

LTD. NORWICH.

DRAWING SIZE
A1

DRAWING No.	SHEET
430328.	5 OF 5

DRAWING No
430328
USED ON 1061

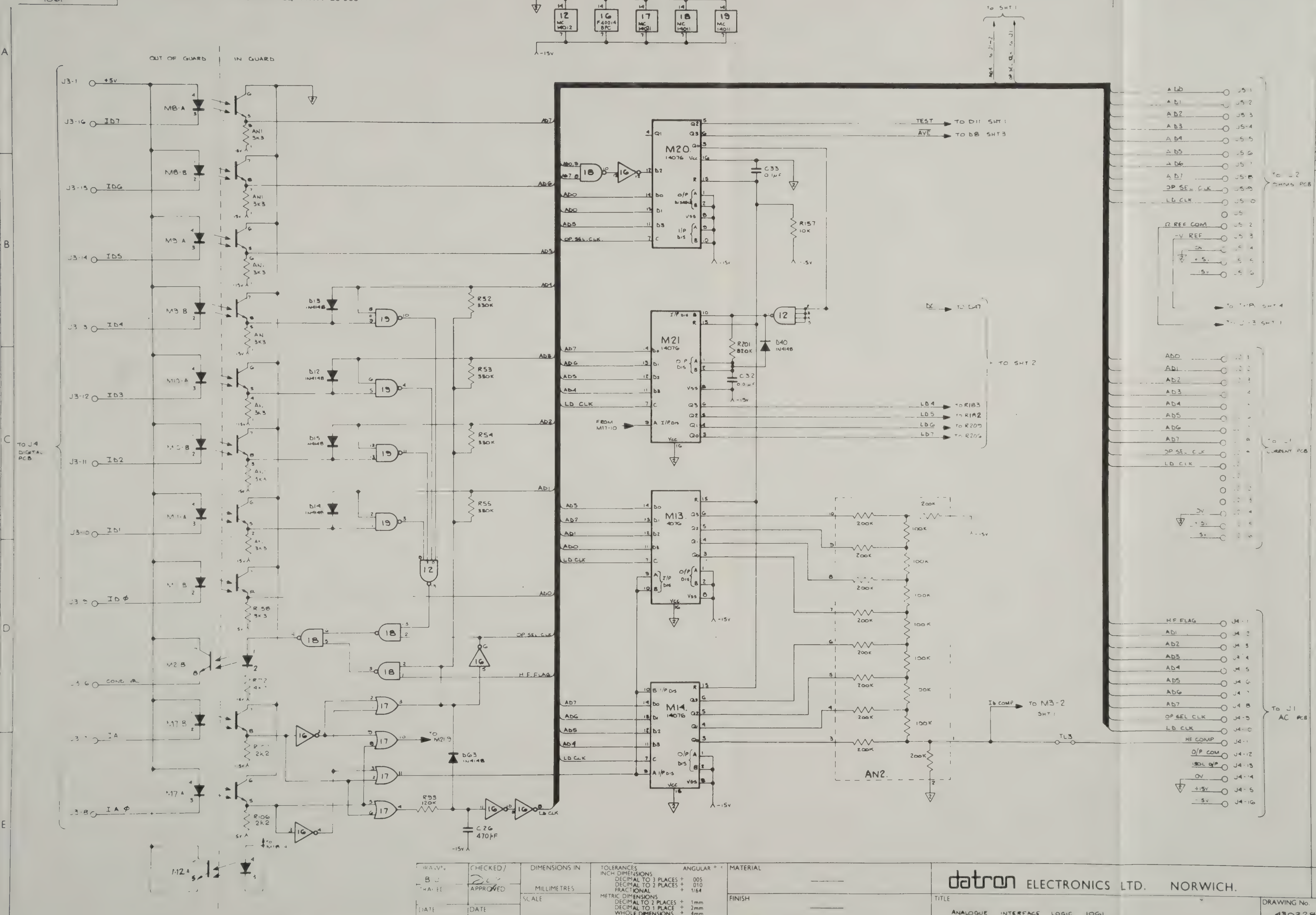
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS	CHANGES
3	RE-DRAWN 19-4-79 ECO 826 834 & BJ ECO 858
4	SEE SHEETS 2+3
5	ECO 929 D40 HAS BEEN RE-INSTATED BJ 16 7-79
6	ECO 959 C59 ADDED ACROSS M16-8 & M16-11 IL 20 9 79
7	SEE SHEET 1 & 2
8	ECO 989 & 997 BJ SEE SHEET 1 20-10 79
9	SEE SHEETS 1 & 2
10	ECO 1098 . 1107 LINK 'F' DELETED M16 WAS 14069 C59 DELETED C26 WAS 1nF R93 WAS 00k R106/R107 WERE 3k3 IL 17 4 80
11	SEE SHEETS 2+3
12	SEE SHEET 3
13	SEE SHEETS 1,3+4



OUT OF GUARD
IN GUARD
J3-1
+5V
J3-16 ID7
J3-15 ID6
J3-14 ID5
J3-13 ID4
J3-12 ID3
J3-11 ID2
J3-10 ID1
ID Ø
COND
IA
J3-8 IA Ø
TO J4 DIGITAL PCB
M8-A
M8-B
M9-A
M9-B
M10-A
M10-B
M11-A
M11-B
M2-B
M7-B
M17-A
M12-A
AN1 3K3
R98 3K3
R106 2K2
D13 1N4148
D12 1N4148
D15 1N4148
D14 1N4148
R52 330K
R53 330K
R54 330K
R55 330K
R93 120K
C26 470pF
DG3 1N4148
LD CLK
H.F. FLAG
OP SEL CLK
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
M20 14076
M21 14076
M13 14076
M14 14076
C33 0.1µF
R157 10K
R201 820K
D40 1N4148
C32 0.01µF
TEST TO D11 SHT 1
AVE TO D8 SHT 3
TO SHT 1
TO SHT 2
FROM M17-10
LD4 TO R183
LD5 TO R182
LD6 TO R205
LD7 TO R206
AN2
200K
100K
ID COMP TO M3-2 SHT 1
TL3
12 MC 14012
16 F40014 BPC
17 MC 14081
18 MC 14081
19 MC 14011
-15V
Ω REF COM
-V REF
0V
+5V
TO J2 OHMS PCB
TO J1 CURRENT PCB
HF FLAG
O/P SEL CLK
HF COMP
O/P COM
ISOL O/P
+15V
-5V
TO J1 AC PCB

DRAWN	CHECKED/	DIMENSIONS IN	TOLERANCES	MATERIAL
BJ		MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES + 005 DECIMAL TO 2 PLACES + 010 FRACTIONAL + 1/64 ANGULAR + METRIC DIMENSIONS DECIMAL TO 2 PLACES + 1mm DECIMAL TO 1 PLACE + 2mm WHOLE DIMENSIONS + 4mm UNLESS OTHERWISE STATED	
TRACED	APPROVED	SCALE		FINISH
DATE 18-4-79	DATE	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

TITLE
ANALOGUE INTERFACE LOGIC 1061

DRAWING SIZE A1

DRAWING No. 430328

SHEET 5 OF 5

DRAWING No
400329
FIRST USED ON 1061

THIRD ANGLE

A

B

C

E

NOTES

1 MAKE TP1-TP29 FROM 22 SWG. B.T.C WIRE – PART Nº 540002.

2 LINKS (LK) MADE FROM 22SWG BTC WIRE (540002) AND SLEEVED (EXCEPT FOR LK19 – LK34) 590004.

3 MOUNT M1. 2 17. 22. 28. 29. 33. 34. 37–40, 44-46. 48. 49 52. 54. 55. 56 ON 14 WAY DIL. SOCKETS. PART Nº 605060 – 21 OFF

4 MOUNT M3–14. 16. 21. 24-27. 32 41. 42 43/60. 47. 50. 58 59. 51. 57 15/61 ON 16 WAY D.I.L. SOCKETS. PART Nº 605061 – 29 OFF

5 MOUNT M30 & 35 ON 24 WAY D.I.L. SOCKETS. PART Nº 605064

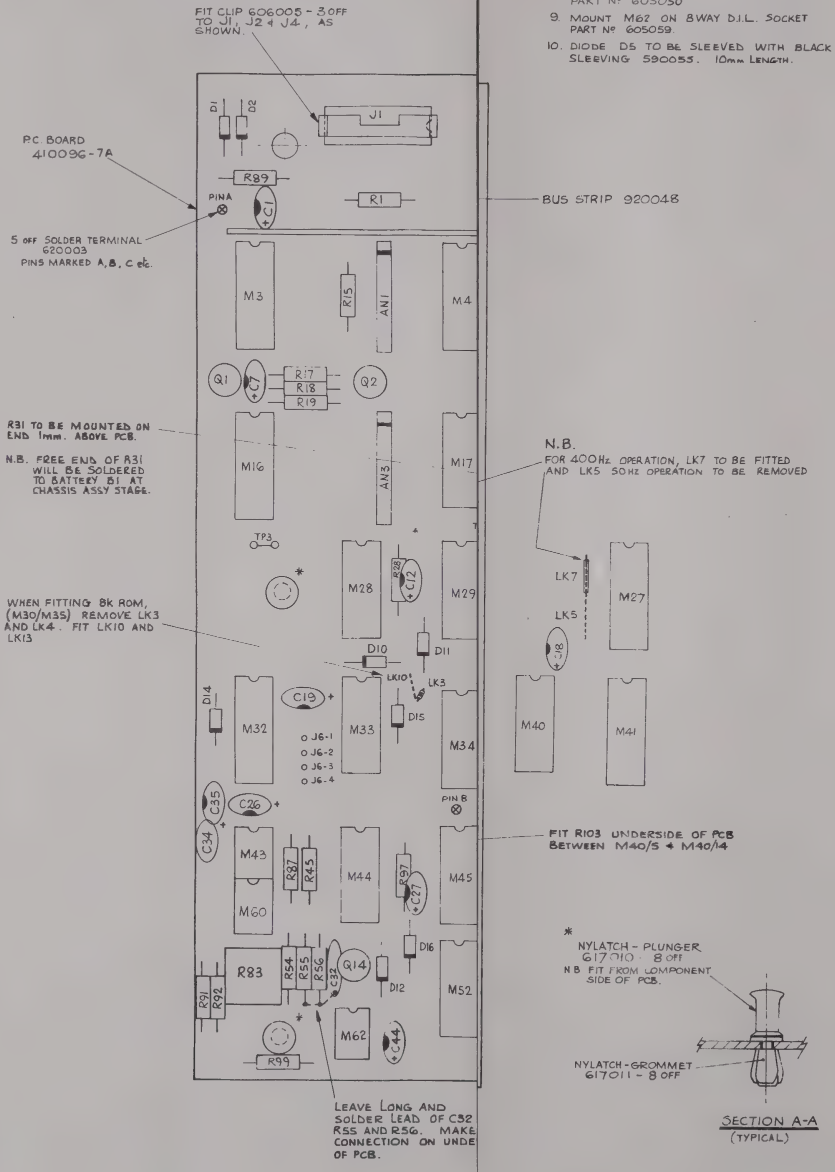
6 MOUNT M19. 20. 31. 36. ON 22 WAY D.I.L. SOCKETS. PART Nº 605063.

7. MOUNT M23 ON 28 WAY D.I.L. SOCKET PART Nº 605065.

8 MOUNT M53 ON 40 WAY D.I.L. SOCKET PART Nº 605050

9. MOUNT M62 ON 8 WAY D.I.L. SOCKET PART Nº 605059.

10. DIODE D5 TO BE SLEEVED WITH BLACK SLEEVING 590055. 10mm LENGTH.



FIT CLIP 606005 - 3 OFF TO J1, J2 & J4, AS SHOWN.

P.C. BOARD 410096-7A

BUS STRIP 920048

5 OFF SOLDER TERMINAL 620003 PINS MARKED A, B, C etc.

R31 TO BE MOUNTED ON END 1mm. ABOVE PCB.

N.B. FREE END OF R31 WILL BE SOLDERED TO BATTERY B1 AT CHASSIS ASSY STAGE.

N.B. FOR 400Hz OPERATION, LK7 TO BE FITTED AND LK5 50Hz OPERATION TO BE REMOVED

WHEN FITTING 8k ROM, (M30/M35) REMOVE LK3 AND LK4. FIT LK10 AND LK13

FIT R103 UNDERSIDE OF PCB BETWEEN M40/5 & M40/14

* NYLATCH - PLUNGER 617010 - 8 OFF
N.B. FIT FROM COMPONENT SIDE OF PCB.

NYLATCH - GROMMET 617011 - 8 OFF

SECTION A-A
(TYPICAL)

LEAVE LONG AND SOLDER LEAD OF C32 R55 AND R56. MAKE CONNECTION ON UNDE OF PCB.

CHANGES		
A		
1	RELEASED TO PRODN 24.11.78	
2	ECO 811 4.1.79 ISS 4 PCB UPDATE IL.	
3	ECO 815 C48 100nF (102101) ADDED C23 WAS 1000nF (130060) C24 WAS 100nF (130061) C25 WAS 47nF (130062) 29 JAN 79 W.G.S.	
4	ECO. 835/852 ISS.5 PCB UPDATE - SEE ECOs FOR FULL DETAILS. IL. 17.4.79	
5	ECOs. 863/872/904 /905/911 /912 PARTS LIST CHANGES IL 19.6.79	
6	ECO. 928 C53 ADDED. PTs. LT. CHANGE To R85 IL 17.7.79	
7	ECO. 941/949 PTs. LT. CHANGE TO R2 IL 4.9.79	EV
8	ECO. 939. 961. 989. 1004 PTs. LT. CHANGE IL 29.10.79	
9	ECOs 998.1000.1032.1045.1067 ISS.6 PCB. UPDATE SEE ECO's FOR FULL DETAILS IL 4.1.80	
10	ECO. 1057 PARTS LIST CHANGE ONLY IL 23.1.80	
11	ECO 1067. WIRE TERMINAL ASSY 400379/1 ADDED W.G.S 13-FEB 80	
12	ECO. 1046.1086.1091.1092 PCB UPDATED ISS. 7A. PARTS LIST CHANGES. IL 20.3.80	
13	ECO. 1108 R103 ADDED. PARTS LIST CHANGES IL 18.4.80	
14	ECO. 1135 R104 ADDED. + PARTS LIST CHANGES IL 18.6.80	
15	ECO. 1137. 1140. 1142 PARTS LIST CHANGES. C32 CONNECTED TO R55 R56. '+' SIGN ADDED To TANT. CAPS. IL 28.7.80	
16	ECO. 1147 D21 ADDED IL 30.9.80	
17	ECO. 1188 R23 WAS 1k - PARTS LIST CHANGE IL 6.1.81	

ONICS LTD. NORWICH.

PCB. ASSY

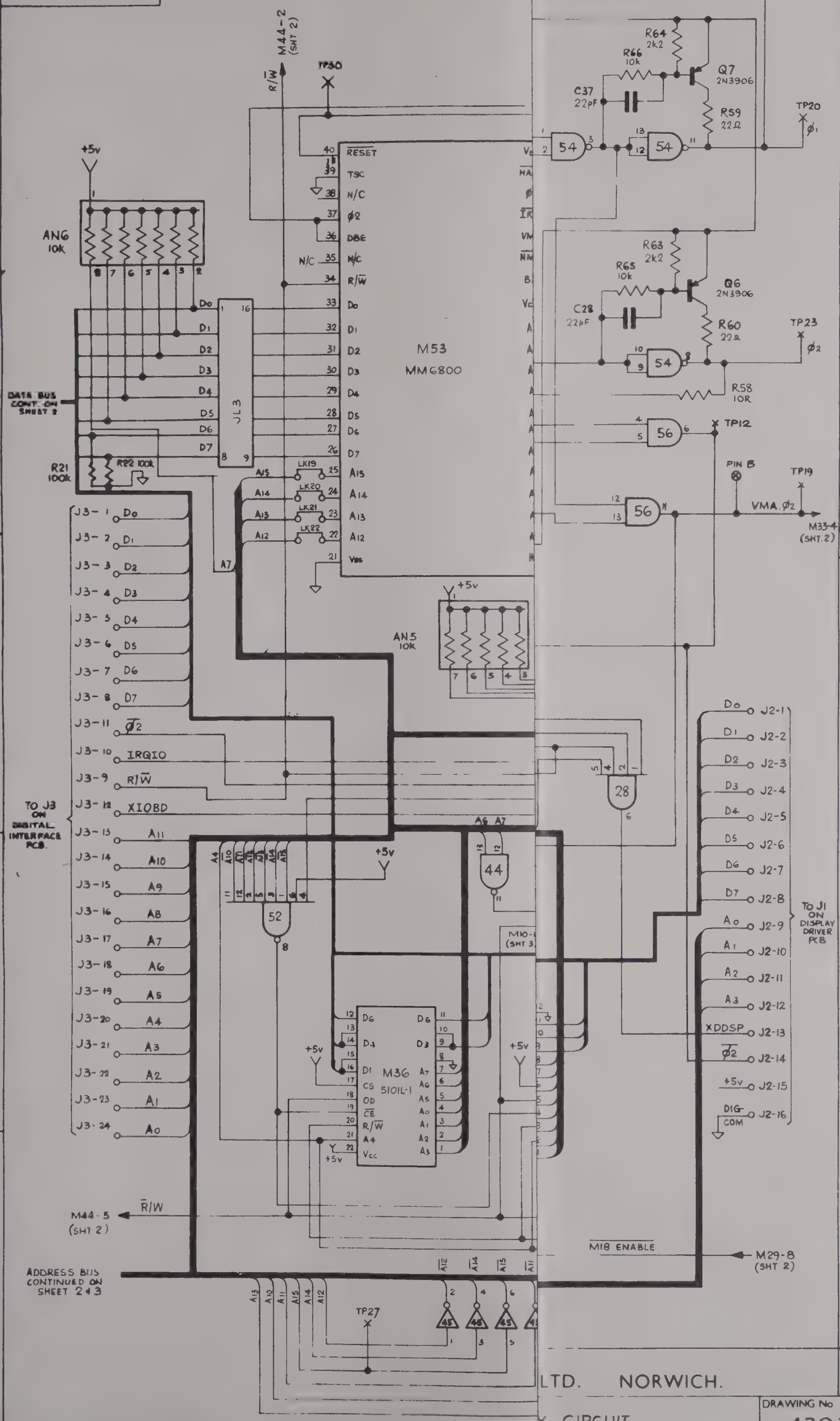
DRAWING SIZE	A1
DRAWING No	400329
SHEET	1 OF 15

DRAWING No
430329
FIRST USED ON

THIRD ANGLE PR

DRAWN IN ACCORDANCE WITH BS 308

NOTES


1
2
7
A
B
C
D
E
M44-2 (SHT 2)
R/W̄
TP30
+5v
ANG 10K
8 7 6 5 4 3 2
D0
D1
D2
D3
D4
D5
D6
D7
JL3
DATA BUS CONT. ON SHEET 3
R21 100k
R22 100k
40 RESET
39 TSC
38 N/C
37 Ø2
36 DBE
N/C 35 N/C
34 R/W̄
33 D0
32 D1
31 D2
30 D3
29 D4
28 D5
27 D6
26 D7
25 A15
24 A14
23 A13
22 A12
21 Vss
LK19
LK20
LK21
LK22
A15
A14
A13
A12
A7
M53
MM6800
R64 2k2
R66 10k
Q7 2N3906
C37 22pF
R59 22Ω
TP20
Ø1
54
R63 2k2
R65 10k
Q6 2N3906
C28 22pF
R60 22Ω
TP23
Ø2
R58 10R
56
TP12
PIN B
TP19
VMA.Ø2
M33-4 (SHT. 2)
+5v
AN5 10k
7 6 5 4 3
J3-1 D0
J3-2 D1
J3-3 D2
J3-4 D3
J3-5 D4
J3-6 D5
J3-7 D6
J3-8 D7
J3-11 Ø2
J3-10 IRQIO
J3-9 R/W̄
J3-12 XIOBD
J3-13 A11
J3-14 A10
J3-15 A9
J3-16 A8
J3-17 A7
J3-18 A6
J3-19 A5
J3-20 A4
J3-21 A3
J3-22 A2
J3-23 A1
J3-24 A0
TO J3 ON DIGITAL INTERFACE PCB.
28
A6 A7
44
52
M10-1 (SHT 3)
M36
5101L-1
D6
D4
D1
CS
OD
CE̅
R/W̄
A4
Vcc
D6
D3
A7
A6
A5
A0
A1
A2
A3
+5v
D0 J2-1
D1 J2-2
D2 J2-3
D3 J2-4
D4 J2-5
D5 J2-6
D6 J2-7
D7 J2-8
A0 J2-9
A1 J2-10
A2 J2-11
A3 J2-12
XDDSP J2-13
Ø2 J2-14
+5v J2-15
DIG COM J2-16
TO J1 ON DISPLAY DRIVER PCB
M44-5 (SHT 2)
R̄/W
M18 ENABLE
M29-8 (SHT 2)
ADDRESS BUS CONTINUED ON SHEET 2 & 3
A12
A14
A15
A11
A13
A10
A11
A15
A14
A12
TP27
45

ISS.	CHANGES
A	
1	RELEASED TO PRODN 24 11.78
2	ECO 811 PCB UPDATE TO ISS4 IL 8 1.79
3	ECO. 815 SHT. 4 OF C49 100pF (102101) ADDED C23 WAS 1000pF (130060) C24 WAS 100pF (130061) C25 WAS 47pF (130062) 29 JAN '79 W.G.S.
4	ECO 835/852 ISS. 5 UPDATE TO PCB IL 4-4-79
5	ECO. 912/911/863 R91 WAS 100k R92 WAS 27k R83 WAS 10k LK17 WAS R62 (0.47R) IL 19.6.79
6	ECO. 928 17.7.79 SEE SHEET 3
7	ECO. 941/940 SEE SHEET. 3 4.9.79
8	ECO. 1004 SEE SHEET 3 IL 29.10.79
9	ECO. 988 JL1 - JL2 REMOVED & REPLACED WITH WIRE LINKS. S2 - S3 REMOVED RST REMOVED. BATTERY ASSY. NOW OBSOLETE. J7 & LK14 DELETED TP30 ADDED. SEE ALSO SHTS 2-4 IL 8.1.80
10	ECO 1046. 1092 SEE SHEETS 3,4+5 IL 24.3.80
11	ECO 1108 R15 WAS 22k R18 WAS 10k IL 18.4.80
12	ECO. 1135 SEE SHEET 4 IL 18.6.80
13	ECO. 1147 D21 ADDED IL 30.9.80
14	ECO. 1188 SEE SHEET 3 IL 6.1.81

BJ

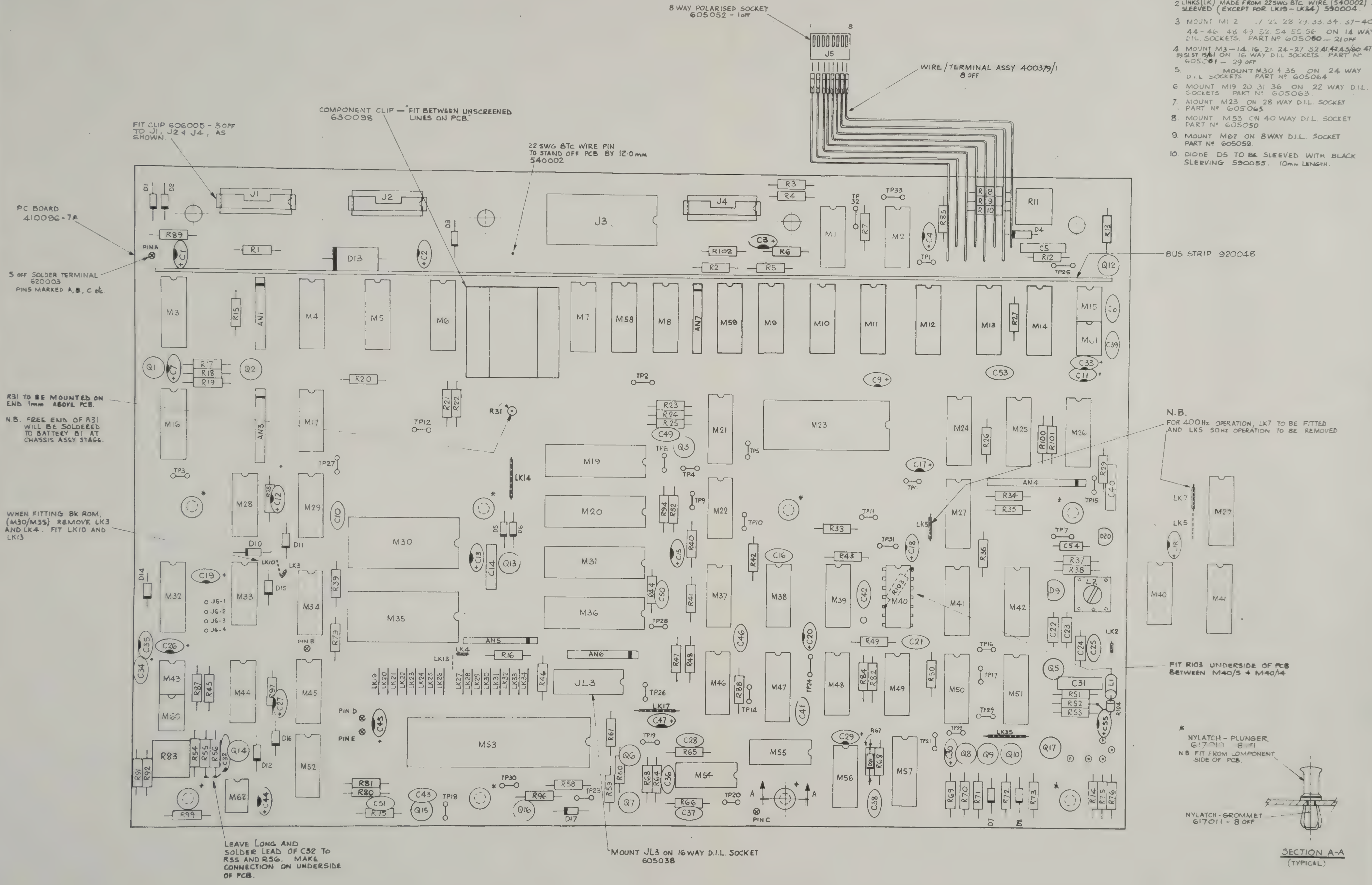
LTD. NORWICH.

Y CIRCUIT

DRAWING SIZE	
A1	
DRAWING No	SHEET
430329	1 OF 4

DRAWING N
400329
FIRST USED ON 1061

THIRD ANGLE PROJECTION


8 WAY POLARISED SOCKET
605052 - 1OFF
J5
WIRE / TERMINAL ASSY 400379/1
8 OFF
COMPONENT CLIP — "FIT BETWEEN UNSCREENED LINES ON PCB."
630098
FIT CLIP 606005 - 3 OFF TO J1, J2 & J4, AS SHOWN.
22 SWG BTC WIRE PIN TO STAND OFF PCB BY 12.0mm
540002
PC BOARD
410096-7A
PIN A
5 OFF SOLDER TERMINAL
620003
PINS MARKED A, B, C etc
BUS STRIP 920048
R31 TO BE MOUNTED ON END 1mm ABOVE PCB.
N.B. FREE END OF R31 WILL BE SOLDERED TO BATTERY B1 AT CHASSIS ASSY STAGE.
WHEN FITTING 8k ROM, (M30/M35) REMOVE LK3 AND LK4. FIT LK10 AND LK13
N.B.
FOR 400Hz OPERATION, LK7 TO BE FITTED AND LK5 50Hz OPERATION TO BE REMOVED
FIT R103 UNDERSIDE OF PCB BETWEEN M40/5 & M40/14
NYLATCH - PLUNGER
617010 - 8 OFF
N.B. FIT FROM COMPONENT SIDE OF PCB.
NYLATCH - GROMMET
617011 - 8 OFF
SECTION A-A
(TYPICAL)
LEAVE LONG AND SOLDER LEAD OF C32 TO R55 AND R56. MAKE CONNECTION ON UNDERSIDE OF PCB.
MOUNT JL3 ON 16 WAY D.I.L. SOCKET
605038
J1
J2
J3
J4
D13
M53
M23
JL3
PIN B
PIN C
PIN D
PIN E
J6-1
J6-2
J6-3
J6-4

NOTES

1. MAKE TP1 - TP29 FROM 22 SWG B.T.C WIRE — PART Nº 540002.
2. LINKS (LK) MADE FROM 22 SWG BTC WIRE (540002) AND SLEEVED (EXCEPT FOR LK19 — LK34) 590004.
3. MOUNT M1 2 ./ 22 28 29. 33. 34. 37–40, 44 - 46 48. 49 52. 54 55. 56 ON 14 WAY DIL. SOCKETS. PART Nº 605060 — 21 OFF
4. MOUNT M3 — 14. 16. 21. 24 - 27 32 41. 42 43/60. 47. 50. 58 59. 51. 57 15/61 ON 16 WAY D.I.L SOCKETS. PART Nº 605061 — 29 OFF
5. MOUNT M30 & 35 ON 24 WAY D.I.L SOCKETS PART Nº 605064
6. MOUNT M19 20. 31 36 ON 22 WAY D.I.L. SOCKETS PART Nº 605063.
7. MOUNT M23 ON 28 WAY D.I.L. SOCKET PART Nº 605065
8. MOUNT M53 ON 40 WAY D.I.L. SOCKET PART Nº 605050
9. MOUNT M62 ON 8 WAY D.I.L. SOCKET PART Nº 605059.
10. DIODE D5 TO BE SLEEVED WITH BLACK SLEEVING 590055. 10mm LENGTH.

A	CHANGES
1	RELEASED TO PRODN 24 11.78
2	ECO 811 4.1.79 ISS 4 PCB UPDATE IL.
3	ECO 815 C48 100nF (102101) ADDED C23 WAS 1000nF (130060) C24 WAS 100nF (130061) C25 WAS 47nF (130062) 29 JAN 79 W.G.S
4	ECO 835/852 ISS.5 PCB UPDATE - SEE ECOs FOR FULL DETAILS. IL. 17.4.79
5	ECOs 863/872/904 /905/911 /912 PARTS LIST CHANGES IL 19.6 79
6	ECO. 928 C53 ADDED. PTs LT CHANGE To R85 IL. 17.7.79
7	ECO. 941/949 PTs LT CHANGE TO R2 IL 4 9 79
8	ECO 939 961 989. 1004 PTs. LT. CHANGE IL 29.10.79
9	ECOs 998.1000.1032.1045 1067 ISS.6 PCB. UPDATE SEE ECO's FOR FULL DETAILS IL 4. 1. 80
10	ECO 1057 PARTS LIST CHANGE ONLY IL 23.1.80
11	ECO 1067 WIRE TERMINAL ASSY 400379/1 ADDED W G S 13-FEB 80
12	ECO.1046 1086 1091 1092 PCB UPDATED ISS. 7A. PARTS LIST CHANGES IL 20.3.80
13	ECO. 1108 R103 ADDED PARTS LIST CHANGES IL 18.4.80
14	ECO. 1135 R104 ADDED. + PARTS LIST CHANGES IL. 18.6.80
15	ECO. 1137. 1140. 1142 PARTS LIST CHANGES C32 CONNECTED TO R55 R56 '+' SIGN ADDED TO TANT. CAPS IL 28.7 80
16	ECO. 1147 D21 ADDED IL. 30.9.80
17	ECO. 1188 R23 WAS 1k - PARTS LIST CHANGE IL [illegible].81

IL.
P.R.H.
2:1
26 6.78

ANGULAR ± °
DECIMAL PLACES ± .005
DECIMAL PLACES ± .010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL PLACES ± 1mm
DECIMAL PLACE ± 2mm
WHOLE DIMENSIONS 4mm
UNLESS OTHERWISE STATED

MATERIAL
FINISH

datron ELECTRONICS LTD. NORWICH.
TITLE 1061 DIGITAL PCB. ASSY
DRAWING SIZE A1
DRAWING No 400329
SHEET 1 OF 15

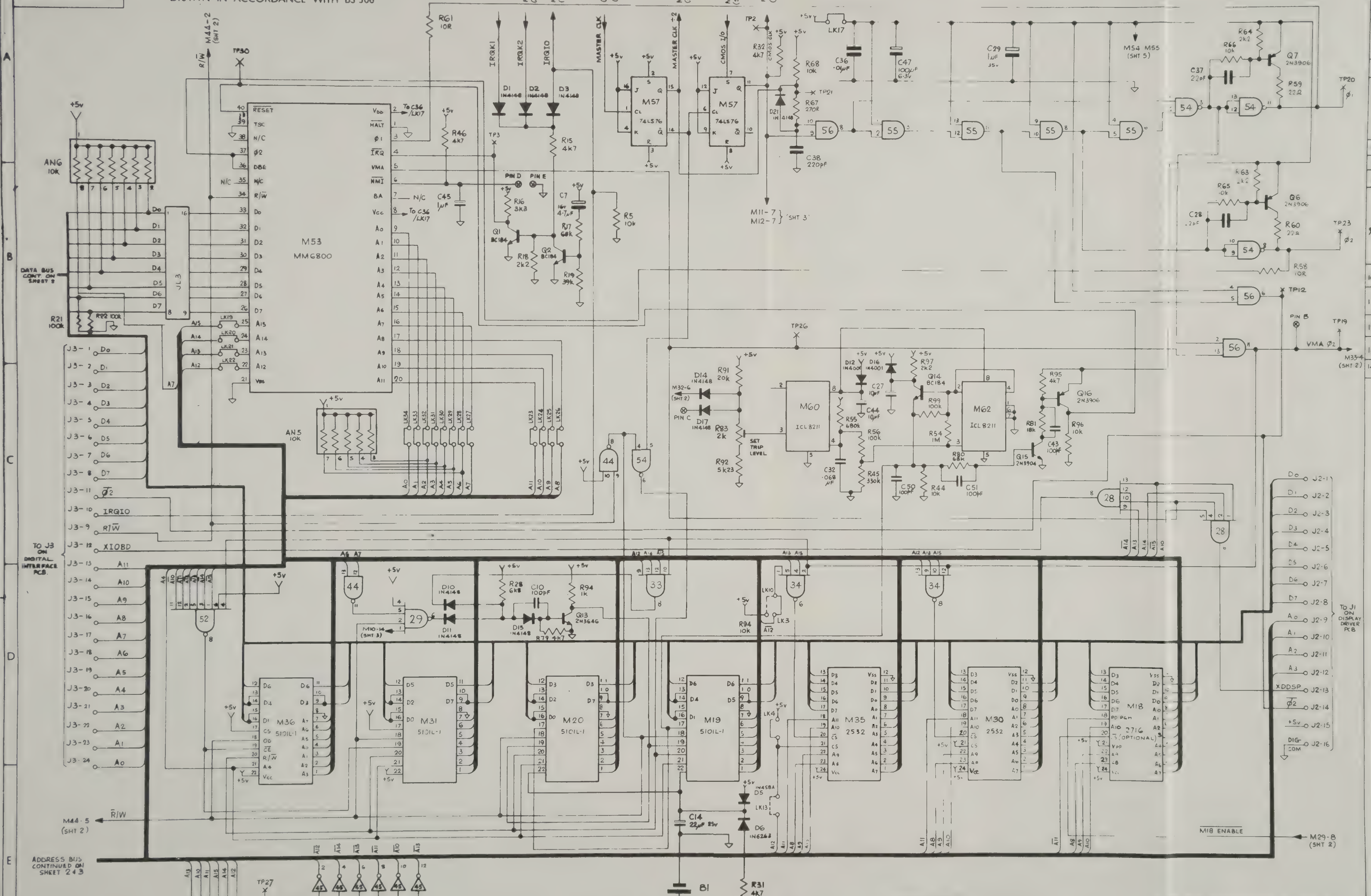
DRAWING No
430329
FIRST USED ON

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES



M53
MMC6800
RESET
TSC
N/C
Ø2
DBE
R/W̄
Vcc
Vss
HALT
Ø1
IRQ
VMA
NMI
BA
M57
74LS76
M60
ICL8211
M62
ICL8211
M36
5101L-1
M31
5101L-1
M20
5101L-1
M19
5101L-1
M35
2532
M30
2532
M18
2716
(OPTIONAL)
JL3
AN6
10k
AN5
10k
DATA BUS CONT. ON SHEET 2
ADDRESS BUS CONTINUED ON SHEET 2 & 3
TO J3 ON DIGITAL INTERFACE PCB.
TO J1 ON DISPLAY DRIVER PCB
IRQK1
IRQK2
IRQIO
MASTER CLK
MASTER CLK ÷2
CMOS I/O
M342 (SHT 2)
M3-14 (SHT 2)
M10-10 (SHT 3)
Q11 (c) (SHT 4)
M23-12 (SHT 3)
M44-1 (SHT 2)
M7-7 (SHT 2)
M44-2 (SHT 2)
M54 M55 (SHT 5)
M11-7
M12-7 } SHT 3
M32-6 (SHT 2)
M10-14 (SHT 3)
M44-5 (SHT 2)
M29-8 (SHT 2)
M33-4 (SHT 2)
M18 ENABLE
VMA Ø2
SET TRIP LEVEL
PIN B
PIN C
PIN D
PIN E
TP2
TP3
TP12
TP19
TP20
TP21
TP23
TP26
TP27
TP30
Ø1
Ø2
LK17
B1
BATTERY FITTED TO DIG BOARD AT CHASSIS ASSY STAGE 400327
RG1 10R
R46 4k7
R15 4k7
R16 3k3
R17 68k
R18 2k2
R19 39k
R5 10k
R21 100k
R22 100k
R32 4k7
R68 10k
R67 270R
R64 2k2
R66 10k
R59 22Ω
R63 2k2
R65 10k
R60 22Ω
R58 10R
R91 20k
R83 2k
R92 5k23
R97 2k2
R99 100k
R55 680k
R56 100k
R54 1M
R45 330k
R80 68k
R44 10k
R95 4k7
R81 18k
R96 10k
R28 6k8
R94 1k
R79 4k7
R31 4k7
C45 1μF
C7 4·7μF
C36 ·01μF
C47 100μF 6·3V
C38 220pF
C29 1μF
C37 22pF
C28 22pF
C27 10pF
C44 10pF
C32 ·068μF
C50 100pF
C51 100pF
C43 100pF
C10 100pF
C14 22μF
D1 1N4148
D2 1N4148
D3 1N4148
D21 1N4148
D14 1N4148
D17 1N4148
D12 1N4001
D16 1N4001
D10 1N4148
D11 1N4148
D15 1N4148
D5 1N458A
D6 1N6263
Q1 BC184
Q2 BC184
Q7 2N3906
Q6 2N3906
Q14 BC184
Q16 2N3906
Q15 2N3904
Q13 2N3646
LK3
LK4
LK10
LK13
LK19
LK20
LK21
LK22
LK23
LK24
LK25
LK26
LK27
LK28
LK29
LK30
LK31
LK32
LK33
LK34
J3-1 D0
J3-2 D1
J3-3 D2
J3-4 D3
J3-5 D4
J3-6 D5
J3-7 D6
J3-8 D7
J3-11 Ø2
J3-10 IRQIO
J3-9 R/W̄
J3-12 XIOBD
J3-13 A11
J3-14 A10
J3-15 A9
J3-16 A8
J3-17 A7
J3-18 A6
J3-19 A5
J3-20 A4
J3-21 A3
J3-22 A2
J3-23 A1
J3-24 A0
D0 J2-1
D1 J2-2
D2 J2-3
D3 J2-4
D4 J2-5
D5 J2-6
D6 J2-7
D7 J2-8
A0 J2-9
A1 J2-10
A2 J2-11
A3 J2-12
XDDSP J2-13
Ø2 J2-14
+5v J2-15
DIG COM J2-16

ISS.	CHANGES
A	
1	RELEASED TO PRODⁿ 24 11 78
2	ECO 811 PCB UPDATE TO ISS4 IL 8 1 79
3	ECO 815 SHT 4 OF C40 100pF (102101) ADDED C28 WAS 1000pF (130060) C36 WAS 100pF (130061) C25 WAS 47pF (130062) 29 JAN'79 W.G.S.
4	ECO 835/852 ISS 5 UPDATE TO PCB IL 4-4-79
5	ECO. 912/911/863 R91 WAS 100k R92 WAS 27k R83 WAS 10k LK17 WAS R62 (0 47R) IL 19.6.79
6	ECO 928 17.7 79 SEE SHEET 3
7	ECO. 941/949 SEE SHEET. 3 4.9.79
8	ECO 1004 SEE SHEET 3 IL 29.10.79
9	ECO [illegible] JL1 - JL2 REMOVED & REPLACED WITH WIRE LINKS S2-S3 REMOVED R57 REMOVED. BATTERY ASSY. NOW OBSOLETE J7 & LK14 DELETED TP30 ADDED. SEE ALSO SHTS 2-4 IL 8.1.80
10	ECO 1046. 1092 SEE SHEETS 3, 4 & 5 IL 24 8 80
11	ECO 1108 R15 WAS 22k R18 WAS 10k IL 18 4 80
12	ECO 1135 SEE SHEET 4 IL 18 6 80
13	ECO 1147 D21 ADDED IL 30.9.80
14	ECO 1188 SEE SHEET 3 IL 6 1 81

BL

DRAWN	DATE
IL	1 9 78
CHECKED	DATE
PRH	
APPROVED	DATE

datron ELECTRONICS LTD. NORWICH.

TITLE 1061 MPU & MEMORY CIRCUIT

DRAWING SIZE A1

DRAWING No 430329

SHEET 1 OF

DRAWING No.
430329

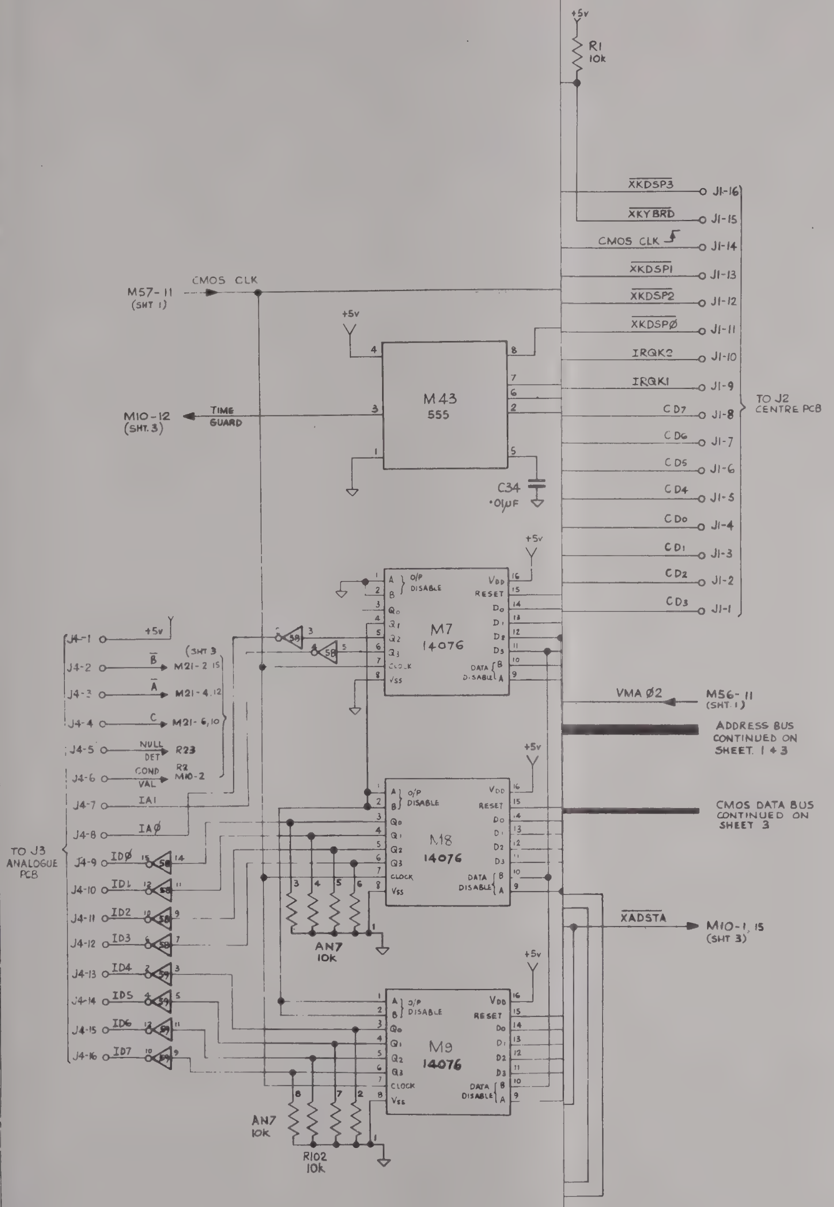
FIRST USED ON

THIRD ANGLE PRC

DRAWN IN ACCORDANCE WITH BS 308

NOTES

ISS.	CHANGES
A	
1	RELEASED TO PROD'Y 24.11.78
2	ECO 811 PCB UPDATE TO ISS 4 IL 8.1.79
3	ECO 815 C48 100nf (102101) ADDED C23 was 1000nf (130060) C24 was 100nf (130061) C25 was 47nf (130062) 29 JAN 79 W.G.S.
4	ISS. 5 UPDATE TO PCB ECO. 835/852 4-4-79 IL
5	SEE SHEETS 1 + 3
6	SEE SHEET 3
7	SEE SHEET 3
8	SEE SHEET 3
9	ECO [illegible] S1 + LK15 - LK16 DELETED. AN7. R102 ADDED IL 8.1.80
10	SEE SHEETS 3,4+5 IL 24.3.80
11	SEE SHEETS 1,3+5 IL 18.4.80
12	SEE SHEET 4
13	SEE SHEET 3


+5v
R1
10k
XKDSP3
J1-16
XKYBRD
J1-15
CMOS CLK
J1-14
XKDSP1
J1-13
XKDSP2
J1-12
XKDSP0
J1-11
IRQK2
J1-10
IRQK1
J1-9
CD7
J1-8
CD6
J1-7
CD5
J1-6
CD4
J1-5
CD0
J1-4
CD1
J1-3
CD2
J1-2
CD3
J1-1
TO J2
CENTRE PCB
M57-11
(SHT 1)
CMOS CLK
M43
555
M10-12
(SHT. 3)
TIME
GUARD
C34
·01µF
M7
14076
O/P
DISABLE
VDD
RESET
CLOCK
VSS
DATA
DISABLE
J4-1
J4-2
J4-3
J4-4
J4-5
J4-6
J4-7
J4-8
J4-9
J4-10
J4-11
J4-12
J4-13
J4-14
J4-15
J4-16
B
M21-2 15
A
M21-4.12
C
M21-6,10
(SHT 3)
NULL
DET
R23
COND
VAL
R2
M10-2
IA1
IA0
ID0
ID1
ID2
ID3
ID4
ID5
ID6
ID7
TO J3
ANALOGUE
PCB
58
VMA Ø2
M56-11
(SHT. 1)
ADDRESS BUS
CONTINUED ON
SHEET. 1 + 3
CMOS DATA BUS
CONTINUED ON
SHEET 3
M8
14076
AN7
10K
XADSTA
M10-1, 15
(SHT 3)
M9
14076
AN7
10K
R102
10k

LTD. NORWICH.

CODE + I/O CIRCUIT

DRAWING [illegible]
A1

DRAWING No.
430329 2 of 5

DRAWING No.
430329

FIRST USED ON

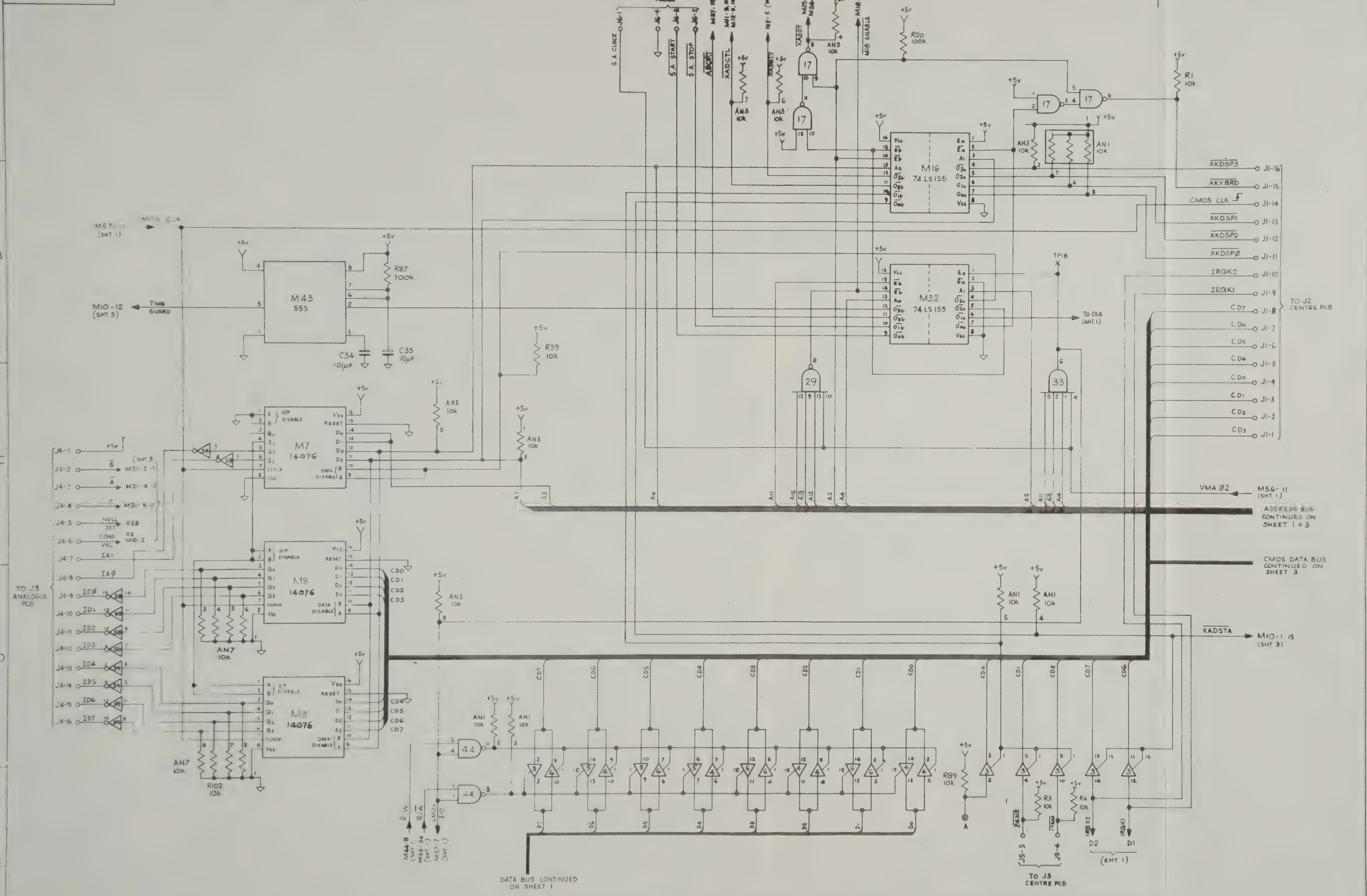
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
A	
1	RELEASED TO PROD 24 11 78
2	ECO 811 PCB UPDATE TO ISS 4 IL 8.1.79
3	ECO 815 C48 100nF (102101) ADDED C23 WAS 1000nF (130040) C24 WAS 100nF (130041) C25 WAS 47nF (130042) 29 JAN 79 W.G.S.
4	ISS 5 UPDATE TO PCB ECO 835/852 4-4-79 IL
5	SEE SHEETS 1 + 3
6	SEE SHEET 3
7	SEE SHEET 3
8	SEE SHEET 3
9	ECO 988 S1 + LK15 - LK16 DELETED. AN7. R102 ADDED IL 8.1.80
10	SEE SHEETS 3,4 + 5 IL 24.3.80
11	SEE SHEETS 1,3 + 5 IL 18.4.80
12	SEE SHEET 4
13	SEE SHEET 3



1
2
3
4
5
6
7
A
B
C
D
E
SIGNATURE ANALYSIS PROBE
S.A. CLOCK
J6-1
J6-4
J6-3
J6-2
S.A. START
S.A. STOP
ABORT
M57-9E (SHT 2)
XADCTL
M11-3,8 (SHT 3)
M12-9,10
ME-5 (SHT 3)
XADLY
XADDT
M25-1 (SHT 3)
M26-1
M18-13 (SHT 1)
M18 ENABLE
+5v
R20 100K
R1 10k
AN3 10k
AN1 10K
17
M16 74 LS 155
M32 74 LS 155
Vcc
Ea
Eb
A0
A1
XKDSP3
XKYBRD
CMOS CLK
XKDSP1
XKDSP2
XKDSP0
IRQK2
IRQK1
CD7
CD6
CD5
CD4
CD0
CD1
CD2
CD3
J1-16
J1-15
J1-14
J1-13
J1-12
J1-11
J1-10
J1-9
J1-8
J1-7
J1-6
J1-5
J1-4
J1-3
J1-2
J1-1
TO J2 CENTRE PCB
TP18
To D14 (SHT 1)
29
33
M57-11 (SHT 1)
MOS CLK
M43 555
R87 100k
M10-12 (SHT 3)
TIME GUARD
C34 ·01μF
C35 10μF
R39 10K
M7 14076
M8 14076
M9 14076
O/P DISABLE
RESET
CLOCK
DATA DISABLE
Vdd
Vss
AN7 10k
R102 10k
J4-1
J4-2
J4-3
J4-4
J4-5
J4-6
J4-7
J4-8
J4-9
J4-10
J4-11
J4-12
J4-13
J4-14
J4-15
J4-16
B
A
C
M21-2 15 (SHT 3)
M21-4 12
M21-6
NULL DET
R23
COND VAL
R2 M10-2
IA1
IA0
ID0
ID1
ID2
ID3
ID4
ID5
ID6
ID7
TO J3 ANALOGUE PCB
A1
A3
A0
A11
A15
A13
A12
A2
A4
A5
A14
VMA Ø2
M56-11 (SHT 1)
ADDRESS BUS CONTINUED ON SHEET 1 + 3
CMOS DATA BUS CONTINUED ON SHEET 3
XADSTA
M10-1, 15 (SHT 3)
44
R/W
IO
M44-8 (SHT 1)
M53-34 (SHT 1)
M57-7 (SHT 1)
D7
D6
D5
D4
D3
D2
D1
D0
DATA BUS CONTINUED ON SHEET 1
R89 10k
R3 10k
R4 10k
24HR
TYBAK
IRQK2
IRQK1
J5-5
J5-4
TO J3 CENTRE PCB
D2
D1
(SHT 1)

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	MATERIAL
IL	P.R.H.	MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED ANGULAR ± ½°	—
TRACED	APPROVED	SCALE —		FINISH —
DATE 13 9 78	DATE	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

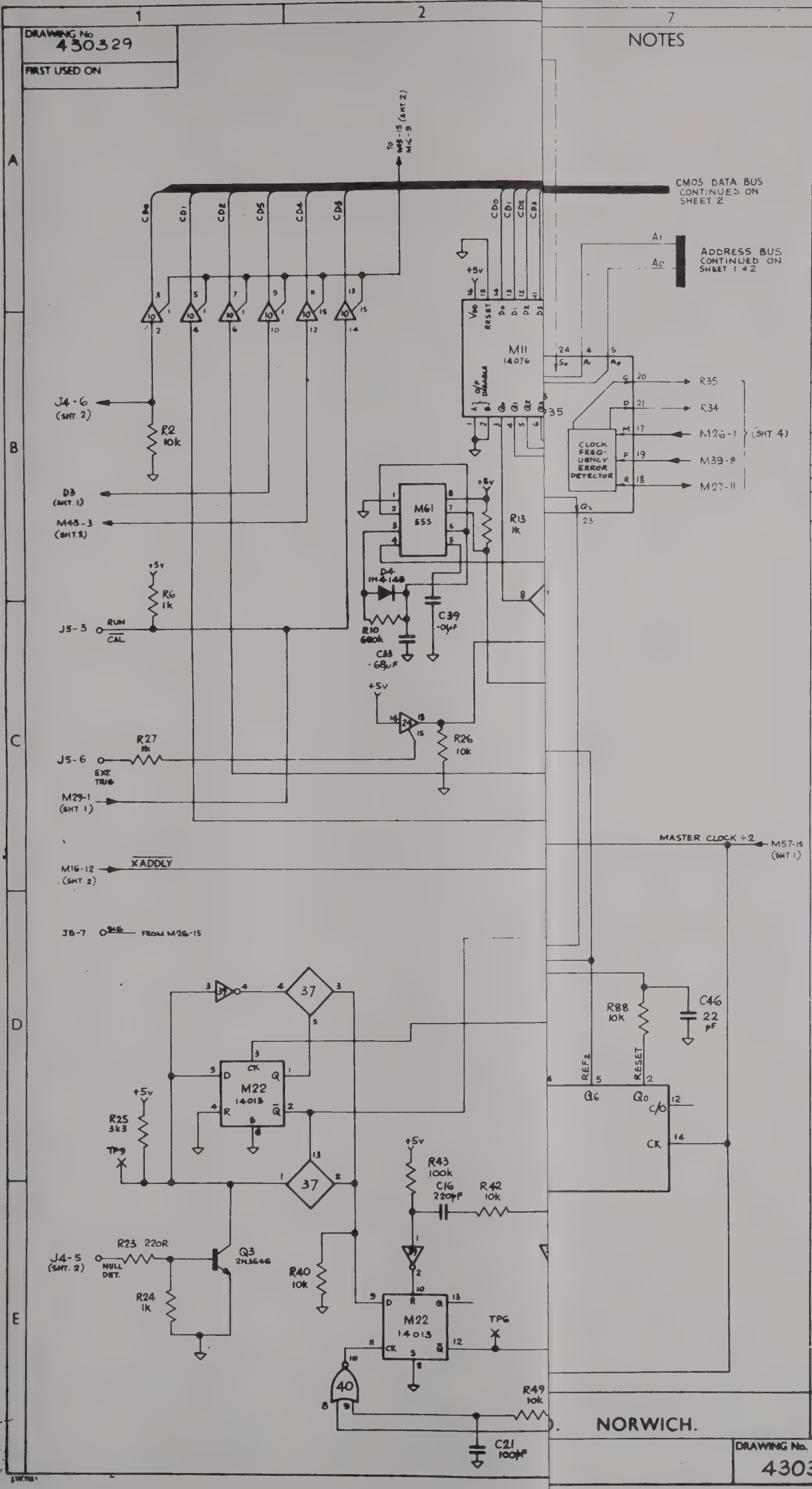
TITLE 1061 CMOS ADDRESS DECODE + I/O CIRCUIT

DRAWING SIZE A1

DRAWING No. 430329 2 of 5

DRAWING No
430329

FIRST USED ON


1
2
7
A
B
C
D
E
TO M8-15 (SHT 2) M16-9
CD0
CD1
CD2
CD5
CD4
CD3
CMOS DATA BUS CONTINUED ON SHEET 2
A1
A0
ADDRESS BUS CONTINUED ON SHEET 1 + 2
M11
14076
+5v
VDD
RESET
O/P DISABLE
S0
A1
A0
24
4
5
20
21
17
19
18
C
D
M
F
R
Q2
23
35
CLOCK FREQUENCY ERROR DETECTOR
R35
R34
M26-1
M39-8
M27-11
(SHT 4)
J4-6 (SHT. 2)
R2 10k
D3 (SHT. 1)
M48-3 (SHT. 2)
M61 555
R13 1k
D4 1N4148
R10 680k
C39 ·01µF
C33 ·68µF
+5v
R6 1k
J5-3
RUN
CAL
R27 1k
J5-6
EXT. TRIG
R26 10k
M29-1 (SHT 1)
M16-12 (SHT 2)
XADDLY
J8-7
FROM M26-15
MASTER CLOCK ÷2
M57-15 (SHT 1)
37
M22 14013
CK
D
R
Q
S
R25 3k3
TP9
R88 10K
C46 22 pF
REF2
RESET
Q6
Q0
C/O
CK
12
14
J4-5 (SHT. 2)
NULL DET.
R23 220R
Q3 2N3646
R24 1K
R40 10k
R43 100k
C16 220pF
R42 10k
TP6
40
R49 10k
C21 100pF

NOTES

ISS.	CHANGES
A	
1	RELEASED TO PRODN 24.11.78
2	ECO 811 PCB UPDATE TO ISS4 IL 8.1.79
3	ECO 816 C48 100pF (60210) ADDED C23 WAS 1000pF (120060) C24 WAS 100pF (130061) C25 WAS 47pF (120062) 29 JAN 79 W.G.S.
4	Q3 WAS BC184 ECO 838 ISS.5 UPDATE TO PCB. ECO 852 4-4-79 IL
5	ECO 896 R10 WAS 680k 19.6.79 IL
6	ECO. 928 C53 ADDED. PL9 LT CHANGE TO R85 17.7.79 IL
7	ECO.941/949 R2 WAS 1k D18 + D19 ADDED IL 4.9.79
8	ECO. 1004 R86 DELETED IL 29.10.79
9	ECO. 998. D18/D19 DELETED TP31-TP33 ADDED IL 8.1.80
10	ECO 1092.1086 R9 WAS 27k R33 WAS 4k7 R41 WAS 10k SEE ALSO SHTS. 4 + 5 IL 24 3.80
11	ECO. 1108 R103 ADDED IL 18.4.80
12	SEE SHEET 4
13	SEE SHEET 1
14	ECO 1188 R23 WAS 1k IL 6.1.81

B.

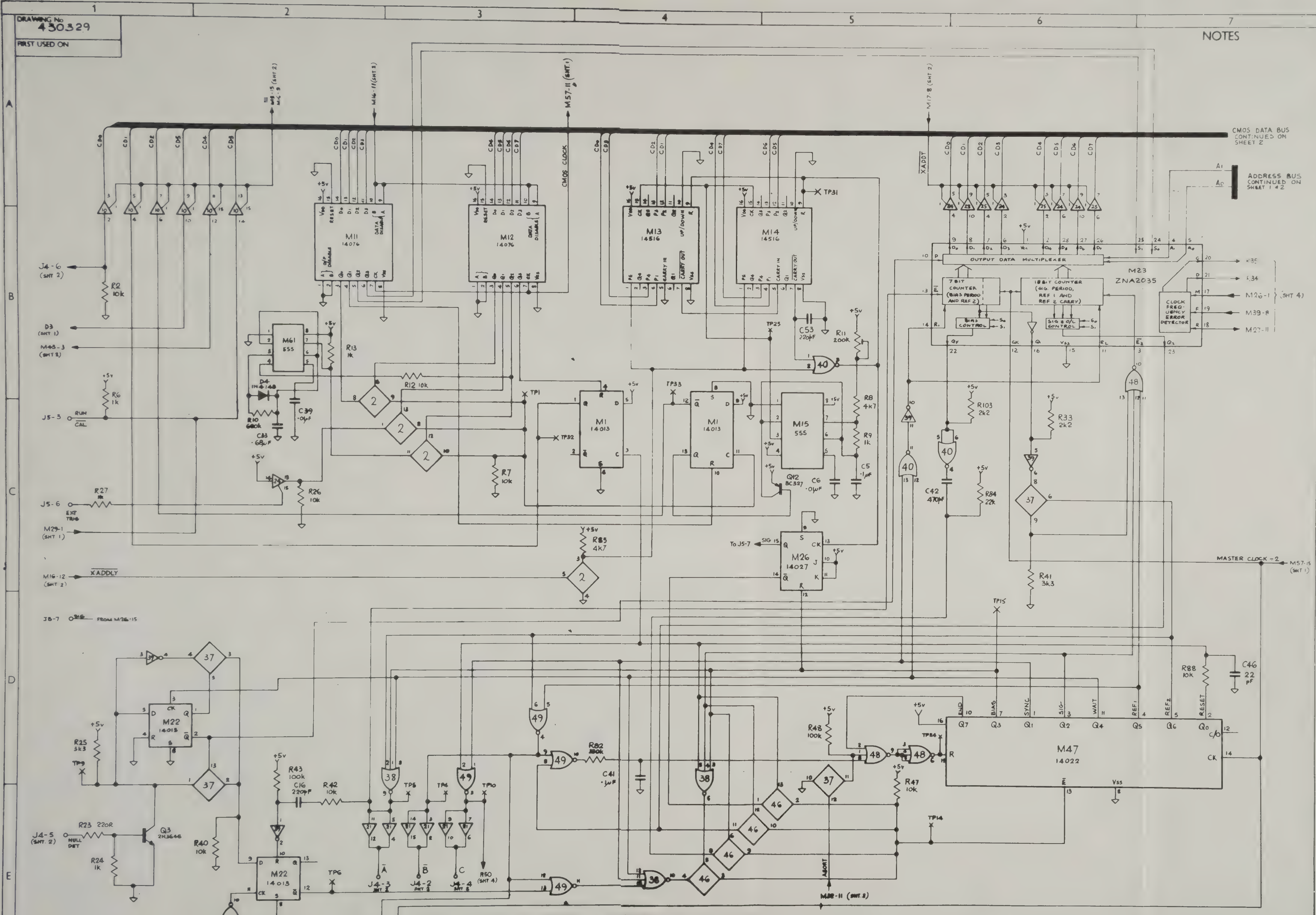
D. NORWICH.

DRAWING SIZE
A1

DRAWING No.
430329 3 of 5

DRAWING No 430329
FIRST USED ON

NOTES



1
2
3
4
5
6
7
A
B
C
D
E
CMOS DATA BUS CONTINUED ON SHEET 2
ADDRESS BUS CONTINUED ON SHEET 1 & 2
A1
A0
M58-15 (SHT 2)
M16-11 (SHT 2)
M57-11 (SHT 1)
M17-8 (SHT 2)
CMOS CLOCK
XADDT
CD0
CD1
CD2
CD3
CD4
CD5
CD6
CD7
CD8
M11 14076
M12 14076
M13 14516
M14 14516
M23 ZNA2035
OUTPUT DATA MULTIPLEXER
7 BIT COUNTER (BIAS PERIOD AND REF 2)
18 BIT COUNTER (SIG. PERIOD, REF 1 AND REF 2 CARRY)
BIAS CONTROL
SIG ± O/L CONTROL
CLOCK FREQUENCY ERROR DETECTOR
M61 555
M15 555
M1 14013
M22 14013
M26 14027
M47 14022
J4-6 (SHT 2)
R2 10k
D3 (SHT 1)
M45-3 (SHT 2)
J5-3 RUN CAL
R6 1k
R13 1k
D4 1N4148
R10 680k
C33 ·68µF
C39 ·01µF
R12 10k
TP1
TP32
TP33
TP31
TP25
C53 220pF
R11 200k
R8 4k7
R9 1k
C5 ·1µF
C6 ·01µF
Q12 BC327
R7 10k
J5-6 EXT TRIG
R27 1k
R26 10k
M29-1 (SHT 1)
R85 4k7
To J5-7
SIG
M16-12 (SHT 2) XADDLY
J8-7 SIG FROM M26-15
R103 2k2
R33 2k2
C42 470pF
R84 22k
R41 3k3
TP15
MASTER CLOCK ÷ 2
M57-15 (SHT 1)
X35
X34
M26-1 (SHT 4)
M39-8
M27-11
R88 10k
C46 22pF
END
BIAS
SYNC
SIG-
WAIT
REF1
REF2
RESET
R48 100k
R47 10k
TP34
TP14
ABORT
M28-11 (SHT 2)
R25 3k3
TP9
J4-5 (SHT 2) NULL DET
R23 220R
Q3 2N3646
R24 1k
R40 10k
R43 100k
C16 220pF
R42 10k
TP8
TP6
TP10
TP5
J4-3 A
J4-2 B
J4-4 C
R50 (SHT 4)
R82 820k
C41 ·1µF
R49 10k
C21 100pF

ISS.	CHANGES
A	
1	RELEASED TO PRODn 24 11 78
2	ECO 811 PCB UPDATE TO ISS4 IL 8.1.79
3	ECO 816 C48 100pF (02101) ADDED C23 was 1000pF (120040) C24 was 100pF (120061) C25 was 47pF (120062) 29 JAN 79 W.G.S
4	Q3 WAS BC184 ECO 835 ISS 5 UPDATE TO PCB ECO 852 4-4-79 IL
5	ECO 896 R10 WAS 680k 19 6.79 IL
6	ECO 928 C53 ADDED. Pl.s U CHANGE TO R85 17.7.79 IL
7	ECO 941/949 R2 WAS 1k D18 + D19 ADDED IL 4.9.79
8	ECO 1004 R86 DELETED IL 29.10.79
9	ECO 998 D18/D19 DELETED TP31-TP33 ADDED IL 8.1.80
10	ECO 1092. 1086 R9 WAS 27k R23 WAS 4k7 R41 WAS 10k SEE ALSO SHTS 4 + 5 IL 24.3.80
11	ECO 1108 R103 ADDED IL 18 4 80
12	SEE SHEET 4
13	SEE SHEET 1
14	ECO 1188 R23 WAS 1k IL 6 1 81

DRAWN	CHECKED	DIMENSIONS IN	[illegible]	MATERIAL
IL	P.R.H.	MILLIMETRES		
TRACED	APPROVED	SCALE		
DATE 13.9.78	DATE	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE A1

TITLE 1061 A-D CONVERTER

DRAWING No. 430329 3 of 5

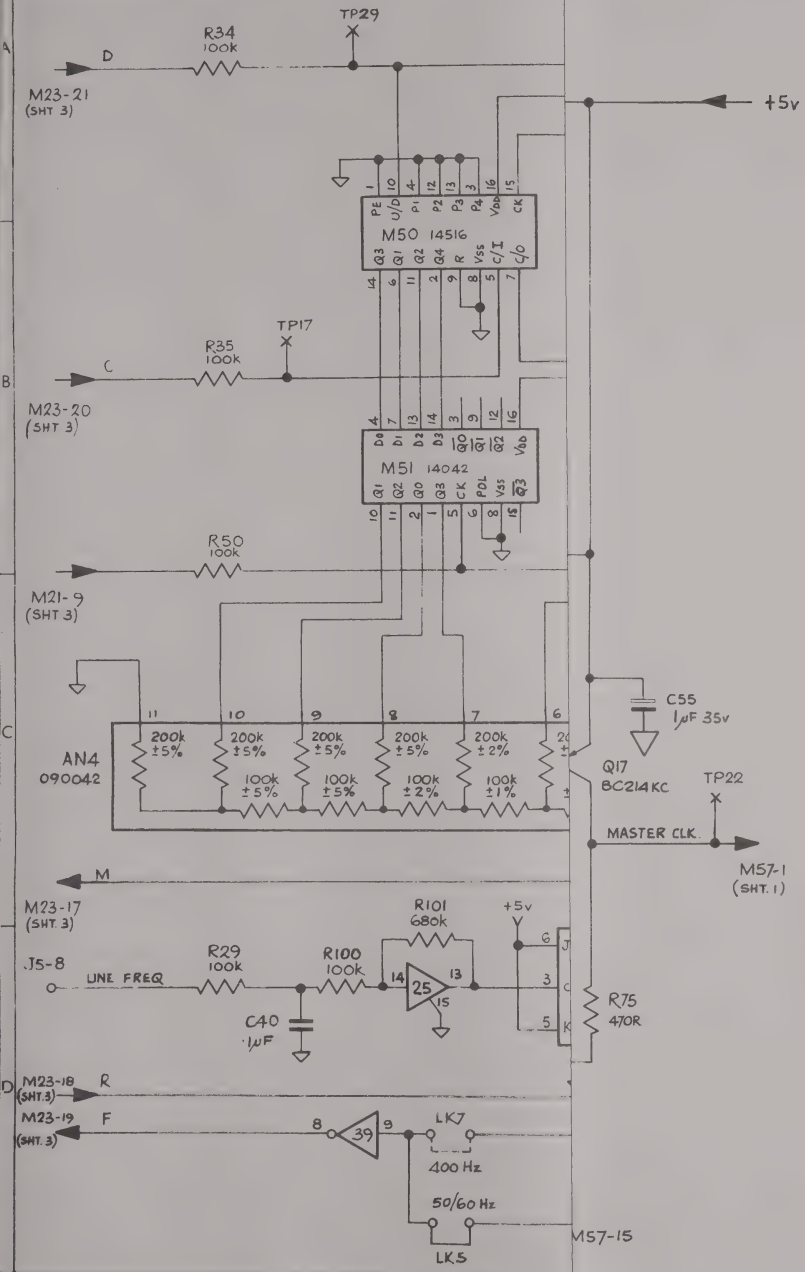
DRAWING No
430329
FIRST USED ON 1061

THIRD ANGL

DRAWN IN ACCORDANCE WI

NOTES

ISS.	CHANGES
A	
1	RELEASED TO PRO 24.11.78
2	ECO 811 PCB UPDATE TO ISSUE 4 IL 8.1.79
3	ECO 815 C48 100pf (102101) ADDED C23 WAS 1000pf (130060) C24 WAS 100pf (130061) C25 WAS 47pf (130062) 29-JAN 79 W.G.G.
4	ISS 5 UPDATE TO P ECO 835/852 4-4-79 IL
5	SEE SHEETS 1 & 3
6	SEE SHEET 3
7	SEE SHEET 3
8	SEE SHEET 3
9	ECO.998 M25 PINS 14 & 13 WERE M39 PINS 13 & 12 RESP. R100. R101 ADDED IL 8.1.80
10	ECO 1046 R98 REPLACED BY LK35 Q11 DELETED D9 WAS MVAM-2 D20, C54, C55 & Q17 ADDED. C22 WAS 470pF R76 WAS 33k R52 WAS 12k R51 WAS 100R IL 24.3.80
11	SEE SHEETS 1 3 AND 5 IL 18.4.80
12	ECO. 1135 R51 WAS 12k Q17 WAS 2N3906 R104 ADDED. IL 18.6.80
13	SEE SHEET 1
14	SEE SHEET 3


1
2
6
A
B
C
D
TP29
R34
100k
D
M23-21
(SHT 3)
+5v
PE
U/D
P1
P2
P3
P4
VDD
CK
M50 14516
Q3
Q1
Q2
Q4
R
VSS
C/I
C/O
TP17
R35
100k
C
M23-20
(SHT 3)
D0
D1
D2
D3
Q0
Q1
Q2
VDD
M51 14042
Q1
Q2
Q0
Q3
CK
POL
VSS
Q3
R50
100k
M21-9
(SHT 3)
AN4
090042
200k ±5%
200k ±5%
200k ±5%
200k ±5%
200k ±2%
100k ±5%
100k ±5%
100k ±2%
100k ±1%
C55
1µF 35v
Q17
BC214KC
TP22
MASTER CLK.
M57-1
(SHT. 1)
M
M23-17
(SHT. 3)
R101
680k
+5v
J5-8
LINE FREQ
R29
100k
R100
100k
25
C40
·1µF
R75
470R
M23-18
(SHT.3)
R
M23-19
F
(SHT. 3)
39
LK7
400 Hz
50/60 Hz
LK5
M57-15

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES ANGU
IL	P.A.H.	MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± 00 DECIMAL TO 2 PLACES ± 01 FRACTIONAL ± 1/6
TRACED	APPROVED	SCALE ______	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1m DECIMAL TO 1 PLACE ± 2m WHOLE DIMENSIONS ± 4m
DATE 18 9. 78	DATE	NOT TO BE SCALED	UNLESS OTHERWISE STATED

ICH.

DRAWING SIZE
A2

DRAWING No	SHEET
430329	4 OF 5

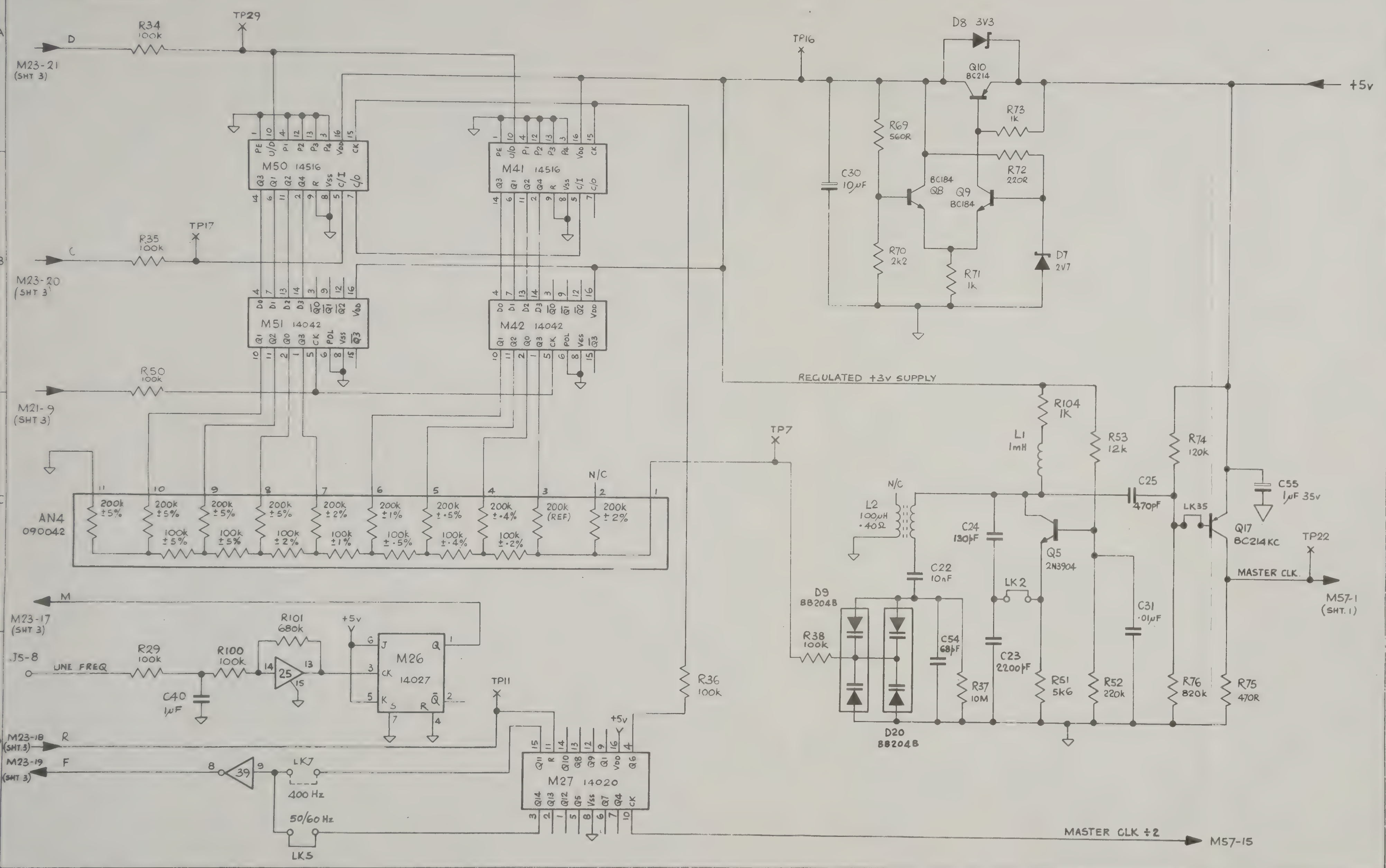
DRAWING No	
430329	
FIRST USED ON	1061

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES


M23-21 (SHT 3)
D
R34 100k
TP29
TP16
D8 3V3
Q10 BC214
+5v
R73 1k
R69 560R
R72 220R
C30 10µF
BC184 Q8
Q9 BC184
R70 2k2
R71 1k
D7 2V7
M50 14516
M41 14516
PE U/D P1 P2 P3 P4 VDD CK
Q3 Q1 Q2 Q4 R VSS C/I C/O
TP17
R35 100k
C
M23-20 (SHT 3)
M51 14042
M42 14042
D0 D1 D2 D3 Q0 Q1 Q2 VDD
Q1 Q2 Q0 Q3 CK POL VSS Q3
R50 100k
M21-9 (SHT 3)
REGULATED +3v SUPPLY
R104 1K
L1 1mH
R53 12k
R74 120k
TP7
AN4 090042
200k ±5%
200k ±2%
200k ±1%
200k ±·5%
200k ±·4%
200k (REF)
100k ±5%
100k ±2%
100k ±1%
100k ±·5%
100k ±·4%
100k ±·2%
N/C
L2 100µH ·40Ω
C24 130pF
C22 10nF
C25 470pF
C55 1µF 35v
LK35
Q17 BC214KC
Q5 2N3904
TP22
MASTER CLK.
M57-1 (SHT. 1)
LK2
C31 ·01µF
D9 BB204B
R38 100k
C54 68pF
C23 2200pF
R37 10M
R51 5k6
R52 220k
R76 820k
R75 470R
D20 BB204B
M
M23-17 (SHT 3)
R101 680k
+5v
J5-8
LINE FREQ
R29 100k
R100 100k
25
M26 14027
J CK K S R Q Q̄
C40 1µF
TP11
R36 100k
M23-18 (SHT 3) R
M23-19 (SHT 3) F
39
LK7
400 Hz
50/60 Hz
LK5
M27 14020
Q11 R Q10 Q8 Q9 Q12 VDD Q6
Q14 Q13 Q12 Q5 VSS Q7 Q4 CK
MASTER CLK ÷2
M57-15

ISS.	CHANGES
A	
1	RELEASED TO PROD 24.11.78
2	ECO 811 PCB UPDATE TO ISSUE 4 IL 8.1.79
3	ECO 815 C48 100pf (102101) ADDED C23 WAS 1000pf (130080) C24 WAS 100pf (130061) C25 WAS 47pf (130062) 29-JAN 79 W.G.G.
4	ISS 5 UPDATE TO PCB ECO 835/852 4-4-79 IL
5	SEE SHEETS 1 & 3
6	SEE SHEET 3
7	SEE SHEET 3
8	SEE SHEET 3
9	ECO.998 M25 PINS 14 & 13 WERE M39 PINS 13 & 12 RESP R100. R101 ADDED IL 8.1.80
10	ECO 1046 R98 REPLACED BY LK35 Q11 DELETED D9 WAS MVAM-2 D20, C54, C55 & Q17 ADDED. C22 WAS 470pF R76 WAS 33k R52 WAS 12k R51 WAS 100R IL 24.3.80
11	SEE SHEETS 1 3 AND 5 IL 18.4.80
12	ECO. 1135 R51 WAS 12k Q17 WAS 2N3906 R104 ADDED. IL 18.6.80
13	SEE SHEET 1
14	SEE SHEET 3

DRAWN IL	CHECKED P.R.H.	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ° INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL
TRACED	APPROVED	SCALE		FINISH
DATE 18 9. 78	DATE	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

TITLE 1061 LINE LOCKING CIRCUIT

DRAWING SIZE A2

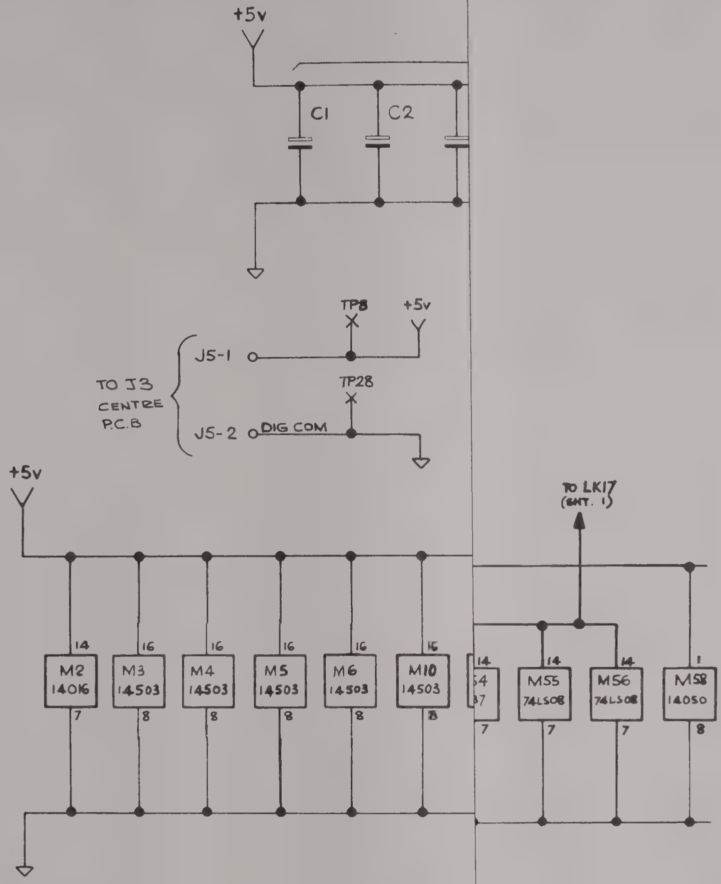
DRAWING No 430329

SHEET 4 OF 5

DRAWING No.
430329
FIRST USED ON

THIRD ANG
DRAWN IN ACCORDANCE

NOTES



+5v
C1
C2
TP8
+5v
TO J3
CENTRE
P.C.B
J5-1
TP28
J5-2
DIG COM
+5v
TO LK17
(SHT. 1)
14
M2
14016
7
16
M3
14503
8
16
M4
14503
8
16
M5
14503
8
16
M6
14503
8
16
M10
14503
8
14
54
37
7
14
M55
74LS08
7
14
M56
74LS08
7
1
M58
14050
8

ALL RESISTORS : 5% ¼ WATT CARBON

▲	
1	RELEASED TO PROD [illegible]
2	ECO 811 PCB UPDATE TO ISSUE 4 IL 8.1.79
3	ECO 815 C48 100nF (D2D1) [illegible] C23 was [illegible] ([illegible]) C24 was 100nF ([illegible]) C25 was 47nF ([illegible]) [illegible] W.A.S.
4	ISS 5 UPDATE TO PCB ECO 836/852 4-4-79 IL
5	SEE SHEETS 1&3
6	SEE SHEET 3
7	SEE SHEET 3
8	SEE SHEET 3
9	ECO.998.1047 SEE SHTS 1-4 M38 WAS 14025 IL 8.1.80
10	ECO.1046 D13 WAS ICTE-5 M37 & M46 WERE 14016 IL 24.3.80
11	ECO. 1108 M40 WAS 14001 IL 18.4.80
12	SEE SHEET 4
13	SEE SHEET 1
14	SEE SHEET 3

DRAWN IL	CHECKED P.R.H.	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 1 PLACE DECIMAL TO PLACES FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES DECIMAL TO 1 PLACE WHOLE DIMENSIONS UNLESS OTHERWISE STAT
TRACED	APPROVED	SCALE	
DATE 12.10.78	DATE	NOT TO BE SCALED	

WICH.

DRAWING SIZE
A2

DRAWING No.
430329

SHEET
5 OF 5

DRAWING No.
430329
FIRST USED ON

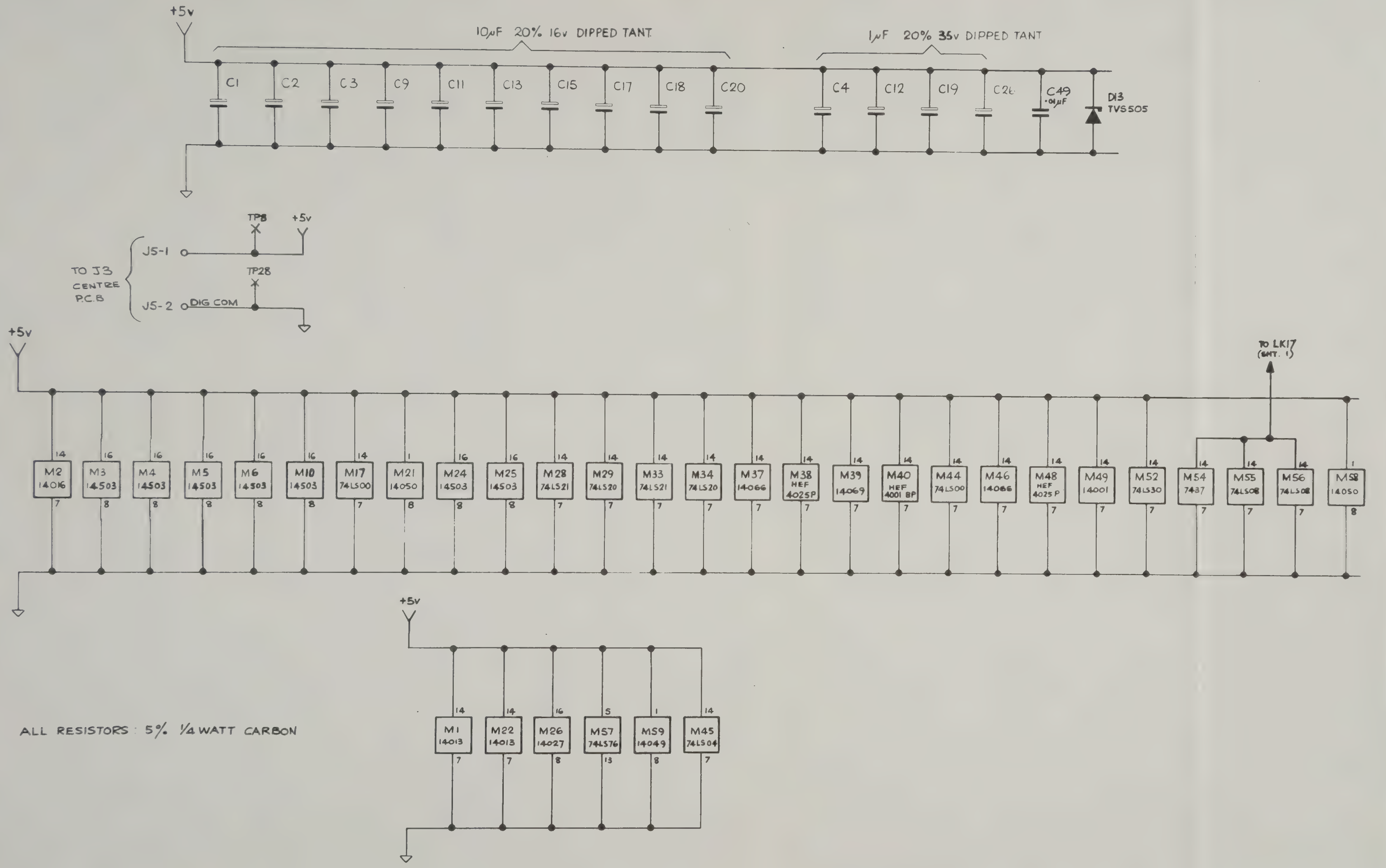
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1	RELEASED TO [illegible] 24.8.78
2	ECO [illegible] PCB UPDATE TO ISSUE 4 IL 8.1.79
3	ECO 815 C48 100nF (0801) [illegible] C23 was 1000nF ([illegible]) C24 was 100nF ([illegible]) C25 was 47nF ([illegible]) 29 [illegible] 79 W.A.S.
4	ISS 5 UPDATE TO [illegible] ECO 886/852 4-4-79 IL
5	SEE SHEETS 1&3
6	SEE SHEET 3
7	SEE SHEET 3
8	SEE SHEET 3
9	ECO. 998. 1047 SEE SHTS 1-4 M38 WAS 14025 IL 8.1.80
10	ECO. 1046 D13 WAS ICTE-5 M37 & M46 WERE 14016 IL 24.3.80
11	ECO. 1108 M40 WAS 14001 IL 18.4.80
12	SEE SHEET 4
13	SEE SHEET 1
14	SEE SHEET 3


+5v
10µF 20% 16v DIPPED TANT.
C1
C2
C3
C9
C11
C13
C15
C17
C18
C20
1µF 20% 35v DIPPED TANT
C4
C12
C19
C26
C49 ·01µF
D13 TVS505
TP8
+5v
TO J3 CENTRE P.C.B
J5-1
TP28
J5-2
DIG COM
+5v
TO LK17 (SHT. 1)
M2 14016
M3 14503
M4 14503
M5 14503
M6 14503
M10 14503
M17 74LS00
M21 14050
M24 14503
M25 14503
M28 74LS21
M29 74LS20
M33 74LS21
M34 74LS20
M37 14066
M38 HEF 4025P
M39 14069
M40 HEF 4001 BP
M44 74LS00
M46 14066
M48 HEF 4025 P
M49 14001
M52 74LS30
M54 7437
M55 74LS08
M56 74LS08
M58 14050
14
16
8
7
1
+5v
M1 14013
M22 14013
M26 14027
M57 74LS76
M59 14049
M45 74LS04
5
13

ALL RESISTORS : 5% ¼ WATT CARBON

DRAWN IL	CHECKED P.R.H.	DIMENSIONS IN MILLIMETRES	TOLERANCES [illegible] INCH DIMENSIONS DECIMAL TO 2 PLACES DECIMAL TO 1 PLACE FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES DECIMAL TO 1 PLACE WHOLE DIMENSIONS UNLESS OTHERWISE STATED	MATERIAL
TRACED	APPROVED	SCALE		FINISH
DATE 12.10.78	DATE	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

TITLE 1061 DIGITAL PCB ASSY

DRAWING SIZE	
A2	
DRAWING No.	SHEET
430329	5 OF 5

DRAWING No.
400330
FIRST USED ON

THIRD A

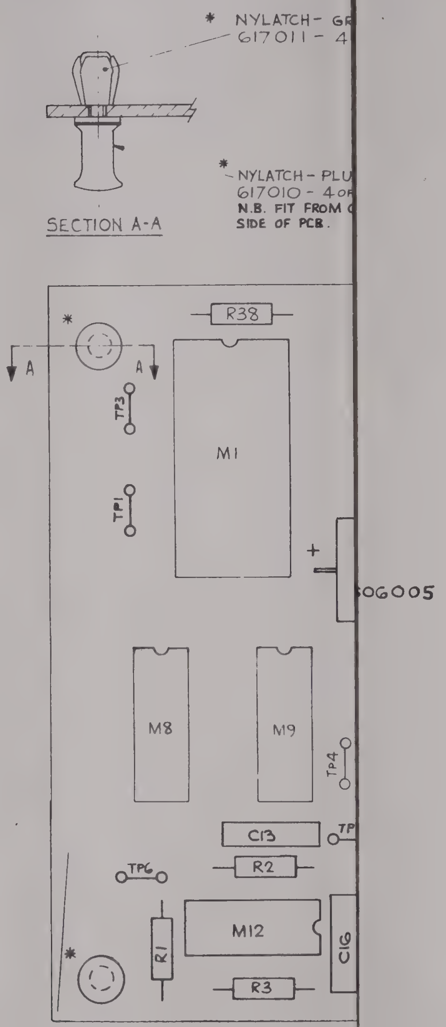
DRAWN IN ACCOR

NOTES

AKE TP1-TP6 FROM 22 SWG. BTC. WIRE —
ART Nº 540002.

C	[illegible]
1	[illegible]
2	C18 [illegible] ECO [illegible] 17 Nov 78. [illegible]
3	[illegible] ADDED [illegible] ADDED ECO [illegible] 20-FEB 79 W.G.S.
4	R40 WAS [illegible] [illegible] ECO [illegible] 10 MAY 79 W.G.S.
5	CLIP FOR J1 WAS 606005. ECO.904 21.6.79 IL
6	ECO 1000 & 1025 RIBBON CABLE CLIP WAS 606007. & J D12 WAS B2Y.

MD
MD
MD



* NYLATCH - GR
617011 - 4
* NYLATCH - PLU
617010 - 4 OF
N.B. FIT FROM
SIDE OF PCB.
SECTION A-A
*
A
A
R38
TP3
M1
TP1
+
606005
M8
M9
TP4
C13
TP
TP6
R2
M12
R1
C16
R3
*

MOUNT M1 & M
SOCKETS 605

DRAWN IL.	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCE INCH DIMENS DECIMAL T DECIMAL T FRACTIONA METRIC DIMEN DECIMAL T DECIMAL T WHOLE DI UNLESS OTHE	NORWICH.
TRACED	APPROVED			
DATE 3. 5. 78	DATE	SCALE 2:1 NOT TO BE SCALED		

DRAWING SIZE
A2

DRAWING No.
400330

SHEET
1 of 7

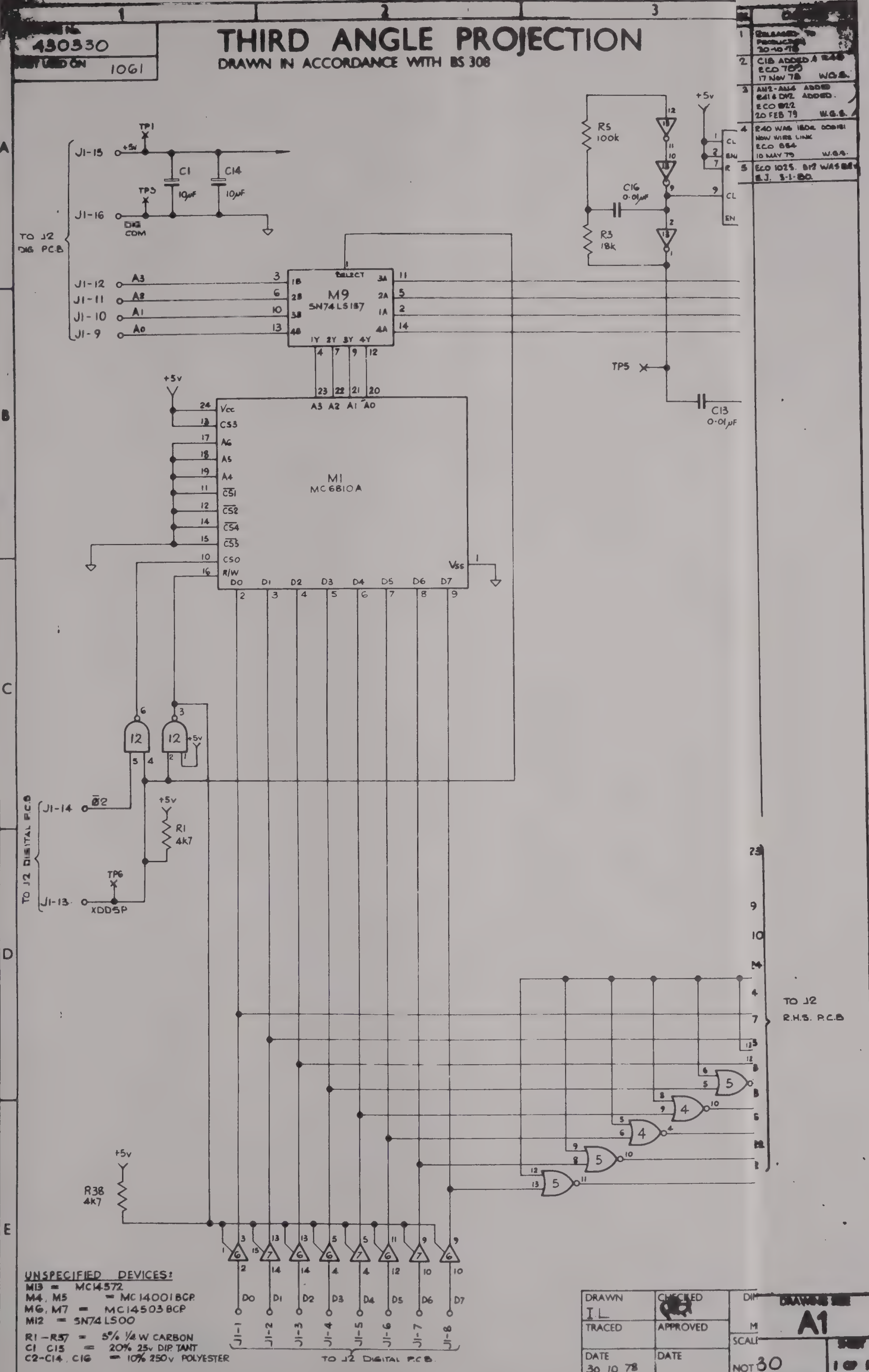
DRAWING No. 430330

FIRST USED ON 1061

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ISS.	CHANGE
1	RELEASED TO PRODUCTION 20-10-78
2	C18 ADDED & R40 ECO 783 17 NOV 78 W.G.S.
3	AN2-AN4 ADDED R41 & D12 ADDED. ECO 822 20 FEB 79 W.G.S.
4	R40 WAS 180Ω [illegible] NOW WIRE LINK ECO 864 10 MAY 79 W.G.S.
5	ECO 1025. D12 WAS [illegible] E.J. 3-1-80.


1
2
3
A
B
C
D
E
TP1
J1-15
+5v
C1
10µF
C14
10µF
TP3
J1-16
DIG COM
TO J2 DIG P.C.B
J1-12
A3
J1-11
A2
J1-10
A1
J1-9
A0
SELECT
M9
SN74LS157
1B
2B
3B
4B
3A
2A
1A
4A
1Y 2Y 3Y 4Y
R5
100k
C16
0·01µF
R3
18k
+5v
CL
EN
R
TP5
C13
0·01µF
+5v
Vcc
CS3
A6
A5
A4
CS1
CS2
CS4
CS5
CS0
R/W
A3 A2 A1 A0
M1
MC6810A
Vss
D0 D1 D2 D3 D4 D5 D6 D7
12
12
+5v
J1-14
Ø2
TO J2 DIGITAL P.C.B
+5v
R1
4k7
TP6
J1-13
XDDSP
+5v
R38
4k7
TO J2
R.H.S. P.C.B
5
4
4
5
5
6
7
6
6
7
6
7
6
D0
D1
D2
D3
D4
D5
D6
D7
J1-1
J1-2
J1-3
J1-4
J1-5
J1-6
J1-7
J1-8
TO J2 DIGITAL P.C.B.

UNSPECIFIED DEVICES:
M13 = MC14572
M4, M5 = MC14001BCP
M6, M7 = MC14503BCP
M12 = SN74LS00

R1 – R57 = 5% ¼W CARBON
C1 C15 = 20% 25v DIP TANT
C2–C14, C16 = 10% 250v POLYESTER

DRAWN I.L	CHECKED	DIM
TRACED	APPROVED	SCALE
DATE 30. 10. 78	DATE	NOT 30

DRAWING SIZE

A1

SHEET

1 OF 1

DRAWING No.
400330
FIRST USED ON

THIRD ANGLE PROJECTION

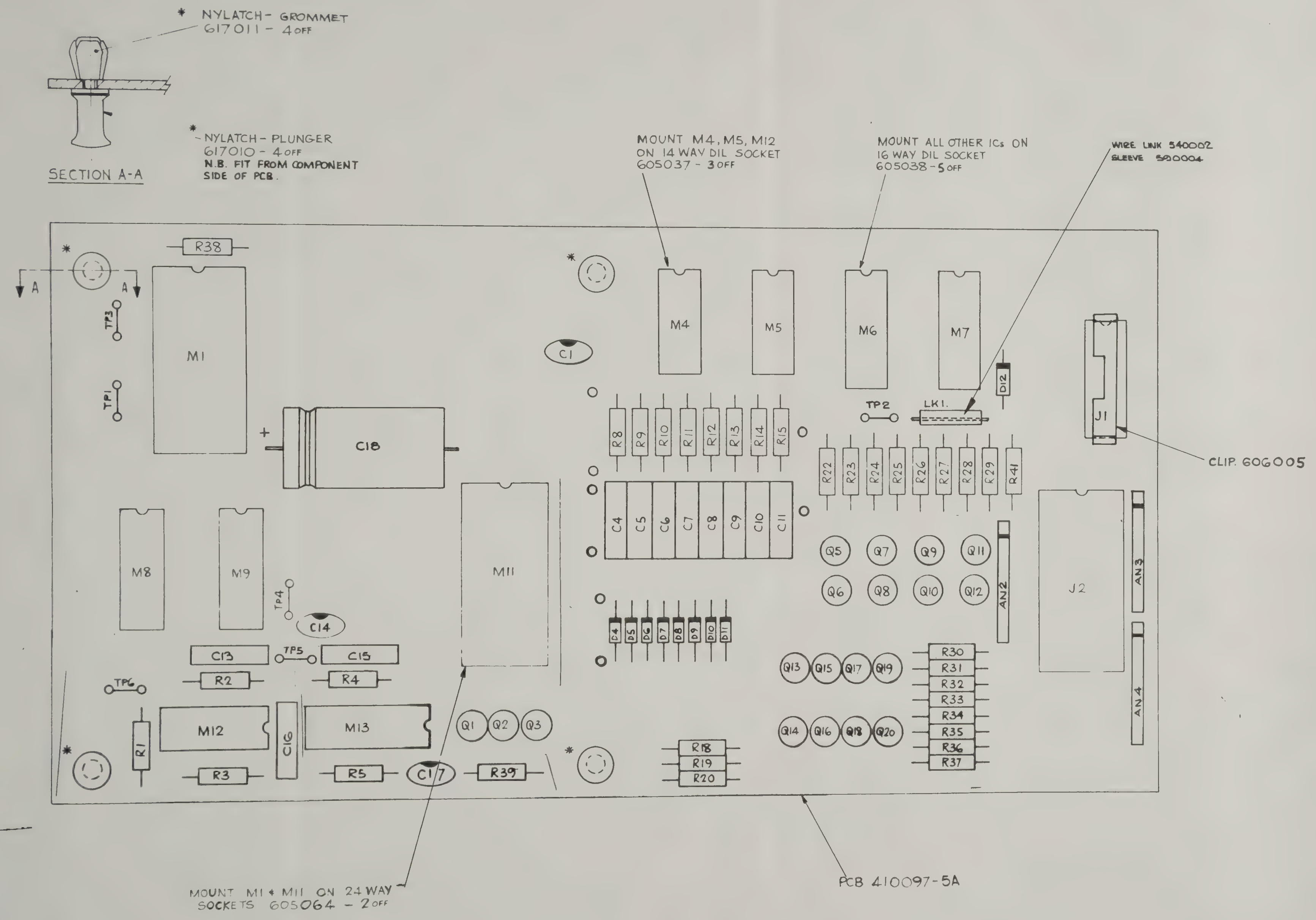
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1. MAKE TP1-TP6 FROM 22 SWG. BTC. WIRE – PART Nº 540002.

C	[illegible]
1	[illegible]
2	C18 [illegible] ECO [illegible] 17 Nov 78. [illegible]
3	[illegible] R41 [illegible] ECO [illegible] 20-FEB 79 [illegible]
4	R40 WAS [illegible] [illegible] ECO [illegible] 10 MAY 79 W.B.S.
5	CLIP FOR J1 [illegible] 606005. ECO.904 21.6.79 IL
6	ECO 1000 & 1025 RIBBON CABLE CLIP WAS 606007. [illegible] D12 WAS B2Y.



SECTION A-A
A
A
TP1
TP2
TP3
TP4
TP5
TP6
R38
M1
M4
M5
M6
M7
M8
M9
M11
M12
M13
C1
C18
+
R8
R9
R10
R11
R12
R13
R14
R15
C4
C5
C6
C7
C8
C9
C10
C11
D4
D5
D6
D7
D8
D9
D10
D11
D12
LK1.
R22
R23
R24
R25
R26
R27
R28
R29
R41
J1
J2
AN2
AN3
AN4
Q5
Q7
Q9
Q11
Q6
Q8
Q10
Q12
Q13
Q15
Q17
Q19
Q14
Q16
Q18
Q20
R30
R31
R32
R33
R34
R35
R36
R37
C13
C14
C15
C16
C17
R1
R2
R3
R4
R5
R39
Q1
Q2
Q3
R18
R19
R20
*

* NYLATCH- GROMMET 617011 - 4 OFF

* NYLATCH - PLUNGER 617010 - 4 OFF
N.B. FIT FROM COMPONENT SIDE OF PCB.

MOUNT M4, M5, M12 ON 14 WAY DIL SOCKET 605037 - 3 OFF

MOUNT ALL OTHER ICs ON 16 WAY DIL SOCKET 605038 - 5 OFF

WIRE LINK 540002
SLEEVE 530004

CLIP. 606005

MOUNT M1 & M11 ON 24 WAY SOCKETS 605064 - 2 OFF

PCB 410097-5A

DRAWN IL	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACE DECIMAL TO 2 PLACES FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES ± ·1mm DECIMAL TO 1 PLACE ± ·2mm WHOLE DIMENSIONS ± ·4mm	MATERIAL SEE PARTS LIST	datron ELECTRONICS LTD. NORWICH.
TRACED	APPROVED	SCALE 2:1		FINISH ————	TITLE 1061 DISPLAY DRIVER PCB. ASSY.
DATE	DATE				

DRAWING SIZE
A2

DRAWING No.
400330

SHEET
1 of 7

430330
1061

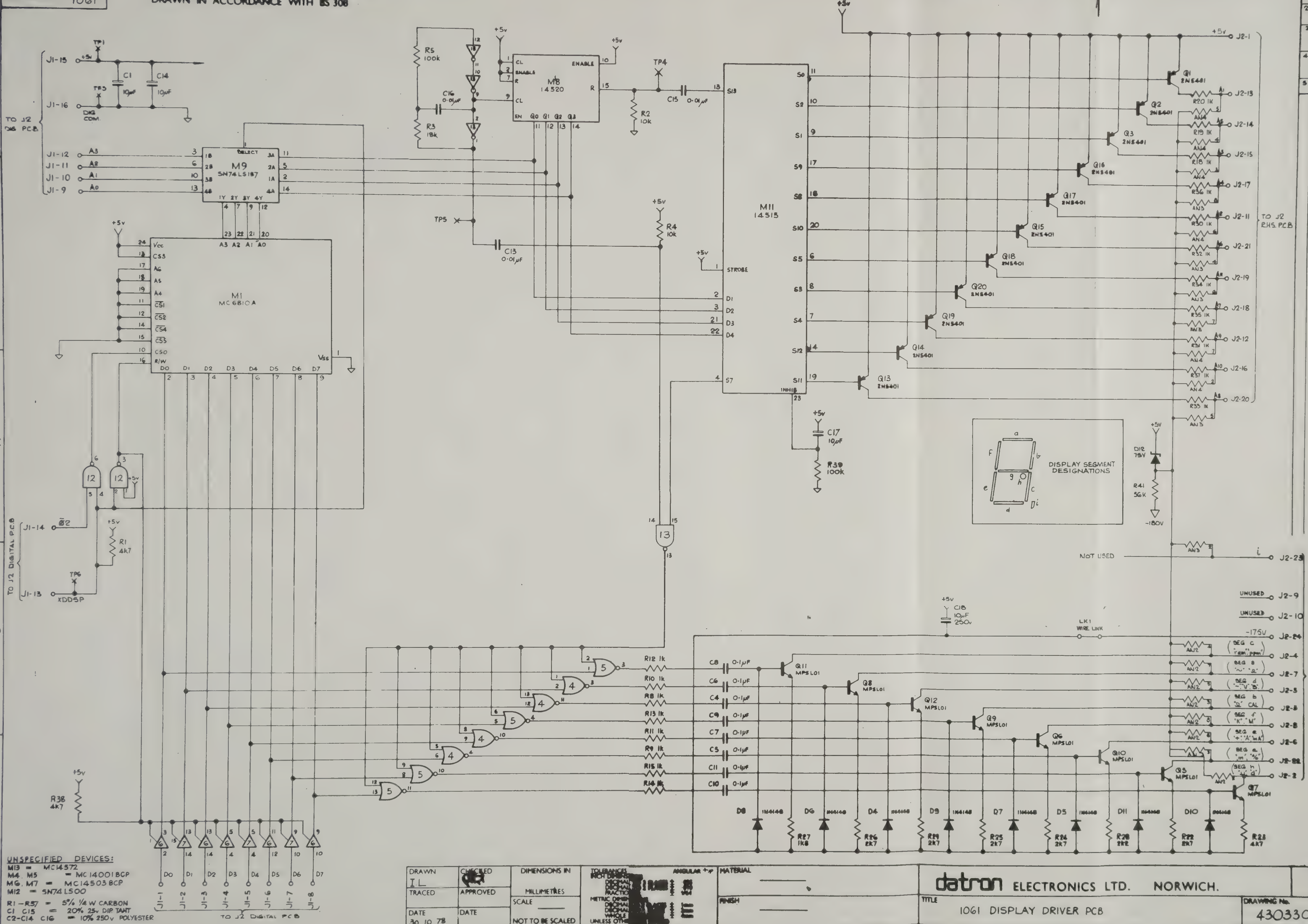
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1	RELEASED TO PRODUCTION 30-10-78
2	C18 ADDED & R40 ECO 705 17 Nov 78 W.G.S.
3	AN2-AN4 ADDED R41 & D12 ADDED. ECO 822 20 FEB 79 W.G.S.
4	R40 WAS 180k NOW WIRE LINK ECO 864 10 MAY 79 W.G.S.
5	ECO 1025 D12 WAS 82v E.J. 3-1-80.


1
2
3
4
5
6
7
A
B
C
D
E
J1-15
+5v
TP1
C1 10µF
C14 10µF
TP3
J1-16
DIG COM
TO J2 DIG PCB
J1-12 A3
J1-11 A2
J1-10 A1
J1-9 A0
M9 SN74LS157
SELECT
1Y 2Y 3Y 4Y
A3 A2 A1 A0
M1 MC6810A
Vcc
CS3
A6
A5
A4
CS1
CS2
CS4
CS5
CS0
R/W
Vss
D0 D1 D2 D3 D4 D5 D6 D7
R5 100k
R3 18k
C16 0·01µF
M8 14520
CL
ENABLE
R
EN Q0 Q1 Q2 Q3
TP4
TP5
C15 0·01µF
C13 0·01µF
R2 10k
R4 10k
M11 14515
S0 S2 S1 S9 S8 S10 S5 S3 S4 S12 S11
STROBE
D1 D2 D3 D4
S7
INHIB
C17 10µF
R39 100k
Q1 2N5401
Q2 2N5401
Q3 2N5401
Q16 2N5401
Q17 2N5401
Q15 2N5401
Q18 2N5401
Q20 2N5401
Q19 2N5401
Q14 2N5401
Q13 2N5401
R20 1K
R19 1K
R18 1K
R36 1K
R30 1K
R32 1K
R34 1K
R35 1K
R31 1K
R37 1K
R33 1K
AN4
AN3
J2-1
J2-13
J2-14
J2-15
J2-17
J2-11
J2-21
J2-19
J2-18
J2-12
J2-16
J2-20
TO J2 R.H.S. PCB
a b c d e f g h Dl
DISPLAY SEGMENT DESIGNATIONS
D12 75V
R41 56K
-180V
NOT USED
J2-23
UNUSED J2-9
UNUSED J2-10
-175V J2-24
C18 10µF 250v
LK1 WIRE LINK
12
13
J1-14 Ø2
R1 4k7
TP6
J1-13 XDDSP
TO J2 DIGITAL PCB
R12 1k
R10 1k
R8 1k
R13 1k
R11 1k
R9 1k
R15 1k
R14 1k
C8 C6 C4 C9 C7 C5 C11 C10 0·1µF
Q11 MPSL01
Q8 MPSL01
Q12 MPSL01
Q9 MPSL01
Q6 MPSL01
Q10 MPSL01
Q5 MPSL01
Q7 MPSL01
AN2
SEG c "rem" "ppm"
SEG b "~" "Ω"
SEG d "-" "V" "Ω"
SEG b "Ω" CAL
SEG f "K" "M"
SEG e "+" "A" "mA"
SEG a "m" "%"
SEG h "µ" "d"
J2-4
J2-7
J2-3
J2-5
J2-8
J2-6
J2-22
J2-2
TO J2 R.H.S. P.C.B
D8 D6 D4 D3 D7 D5 D11 D10 1N4148
R27 1K8
R26 2K7
R29 2K7
R25 2K7
R24 2K7
R28 2K2
R22 2K7
R23 4K7
R38 4K7
D0 D1 D2 D3 D4 D5 D6 D7
J1-1 J1-2 J1-3 J1-4 J1-5 J1-6 J1-7 J1-8
TO J2 DIGITAL PCB

UNSPECIFIED DEVICES:
M13 = MC14572
M4, M5 = MC14001BCP
M6, M7 = MC14503BCP
M12 = SN74LS00

R1 – R57 = 5% 1/4 W CARBON
C1 C15 = 20% 25v DIP TANT
C2-C14 C16 = 10% 250v POLYESTER

DRAWN	CHECKED	DIMENSIONS IN
I.L		MILLIMETRES
TRACED	APPROVED	SCALE
DATE 30 10 78	DATE	NOT TO BE SCALED

TOLERANCES UNLESS OTHERWISE STATED

MATERIAL

FINISH

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE A1

TITLE 1061 DISPLAY DRIVER PCB

DRAWING No. 430330

SHEET 1 of 1

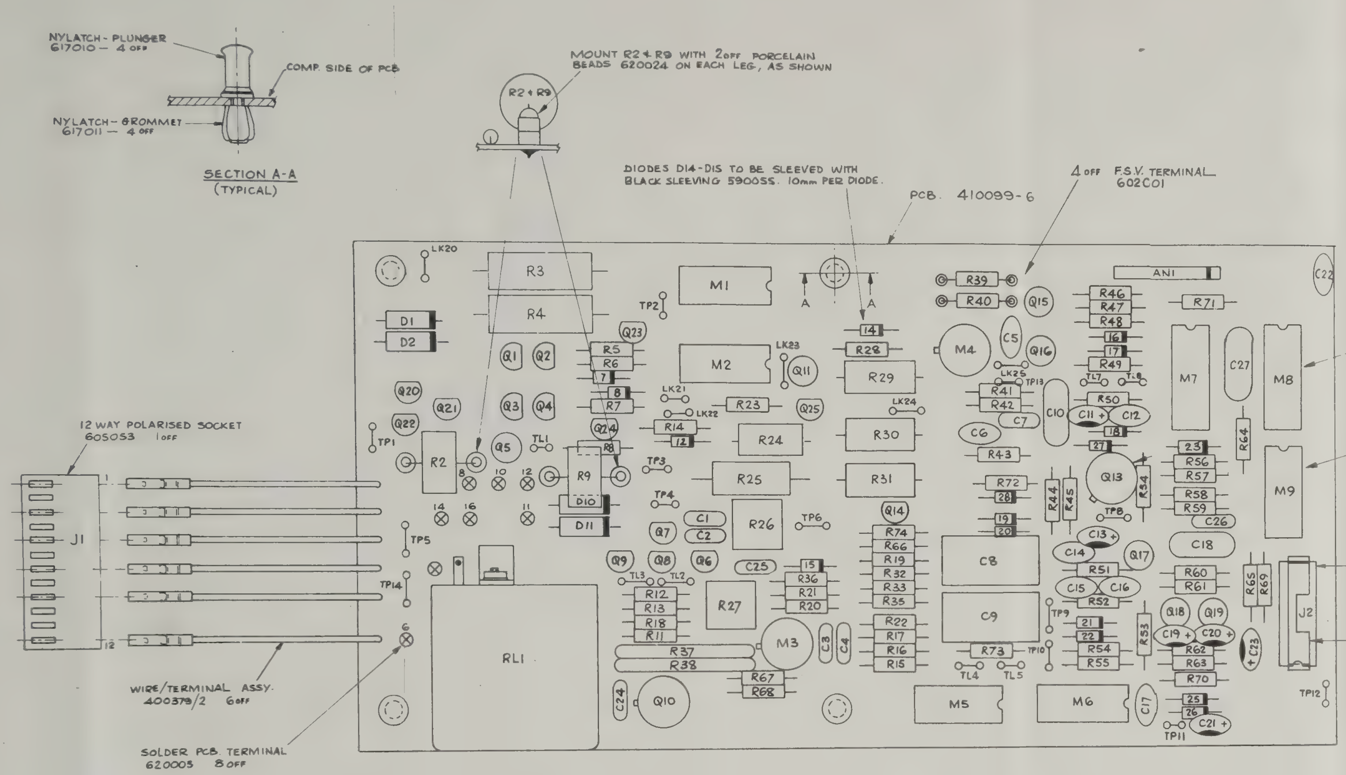
1 2 3 4

DRAWING No 400331
FIRST USED ON 1061

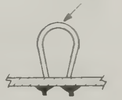
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

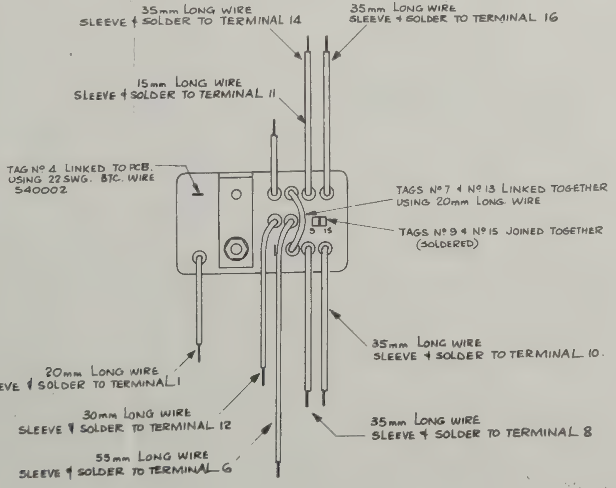
CHANGES
12 ECO 1176
ASSY COMPLETELY RE-DRAWN. PCB. WAS ISSUE 4.
R71 – R74 ADDED
R68/R70 TRACKED-IN.
R10 DELETED
C27 D28 ADDED
C26 D27 TRACKED-IN
OTHER PARTS LIST CHANGES - SEE ECO
IL 28 11 80


NYLATCH - PLUNGER 617010 — 4 OFF
COMP. SIDE OF PCB
NYLATCH - GROMMET 617011 — 4 OFF
SECTION A-A
(TYPICAL)
MOUNT R2 & R9 WITH 2 OFF PORCELAIN BEADS 620024 ON EACH LEG, AS SHOWN
R2 + R9
DIODES D14-D15 TO BE SLEEVED WITH BLACK SLEEVING 590055. 10mm PER DIODE.
PCB. 410099-6
4 OFF F.S.V. TERMINAL 602C01
12 WAY POLARISED SOCKET 605053 1 OFF
J1
WIRE/TERMINAL ASSY. 400379/2 6 OFF
SOLDER PCB. TERMINAL 620005 8 OFF
LK20
R3
R4
M1
M2
TP2
A
A
D1
D2
Q1
Q2
Q3
Q4
Q5
Q7
Q8
Q9
Q6
Q10
Q11
Q14
Q15
Q16
Q17
Q18
Q19
Q20
Q21
Q22
Q23
Q24
Q25
R5
R6
R7
R8
R9
R2
R12
R13
R14
R18
R11
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
R33
R35
R36
R19
R20
R21
R15
R16
R17
R22
R37
R38
R39
R40
R41
R42
R43
R44
R45
R46
R47
R48
R49
R50
R51
R52
R53
R54
R55
R56
R57
R58
R59
R60
R61
R62
R63
R64
R65
R66
R67
R68
R69
R70
R71
R72
R73
R74
D10
D11
LK21
LK22
LK23
LK24
LK25
TP1
TP3
TP4
TP5
TP6
TP8
TP9
TP10
TP11
TP12
TP13
TP14
TL1
TL2
TL3
TL4
TL5
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
M3
M4
M5
M6
M7
M8
M9
Q13
AN1
J2
RL1
MOUNT M7 & M8 ON 16 WAY DIL. SOCKETS. 605061 2 OFF
MOUNT Q13 ON PAD 618002
MOUNT M1, M2, M5, M6 & M9 ON 14 WAY DIL. SOCKETS. 605060 5 OFF
16 WAY DIL SOCKET 605002 1 OFF
RED CLIP 1 OFF 606005

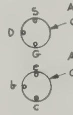
ALL TEST POINTS TO BE MADE FROM 22 SWG BTC WIRE. 540002



N.B. SOME LINKS SHOWN AS TEST POINT LOOPS SHOULD ALSO BE FORMED THUS, FOR EASE OF PRODUCTION (eg. LK20)


35mm LONG WIRE SLEEVE & SOLDER TO TERMINAL 14
35mm LONG WIRE SLEEVE & SOLDER TO TERMINAL 16
15mm LONG WIRE SLEEVE & SOLDER TO TERMINAL 11
TAG No 4 LINKED TO PCB. USING 22 SWG. BTC. WIRE 540002
TAGS No 7 & No 13 LINKED TOGETHER USING 20mm LONG WIRE
TAGS No 9 & No 15 JOINED TOGETHER (SOLDERED)
9
15
35mm LONG WIRE SLEEVE & SOLDER TO TERMINAL 10.
20mm LONG WIRE SLEEVE & SOLDER TO TERMINAL 1
30mm LONG WIRE SLEEVE & SOLDER TO TERMINAL 12
35mm LONG WIRE SLEEVE & SOLDER TO TERMINAL 8
55mm LONG WIRE SLEEVE & SOLDER TO TERMINAL 6

NOTE
ALL WIRE IS 540008 PTFE INSULATED WHITE.
ALL LENGTHS OF WIRE SHOWN ON RELAY ARE TOTAL LENGTHS, THEN 4mm IS TO BE STRIPPED FROM EACH END.
SLEEVE WIRES WITH 590001 ½ PIECE FOR EACH CONNECTION. ie. 1 PIECE FOR EACH WIRE.



ALL SINGLE FET LEGS IN THE ORDER SHOWN
ALL TRANSISTOR LEGS IN THE ORDER SHOWN

IL
30.7.80
2:1

TOLERANCE	ANGULAR ±
DIMENSIONS	
DECIMAL TO 3 PLACES ±	.005
DECIMAL TO 2 PLACES ±	.010
FRACTIONAL ±	1/64
DIMENSIONS	
DECIMAL TO 2 PLACES ±	1mm
DECIMAL TO 1 PLACE ±	2mm
WHOLE DIMENSIONS ±	4mm
UNLESS OTHERWISE STATED	

MATERIAL ——
FINISH ——

datron ELECTRONICS LTD. NORWICH.
TITLE 1061 OHMS PCB. ASSY.
DRAWING SIZE A1
DRAWING No. 400331
SHEET 1 OF 12

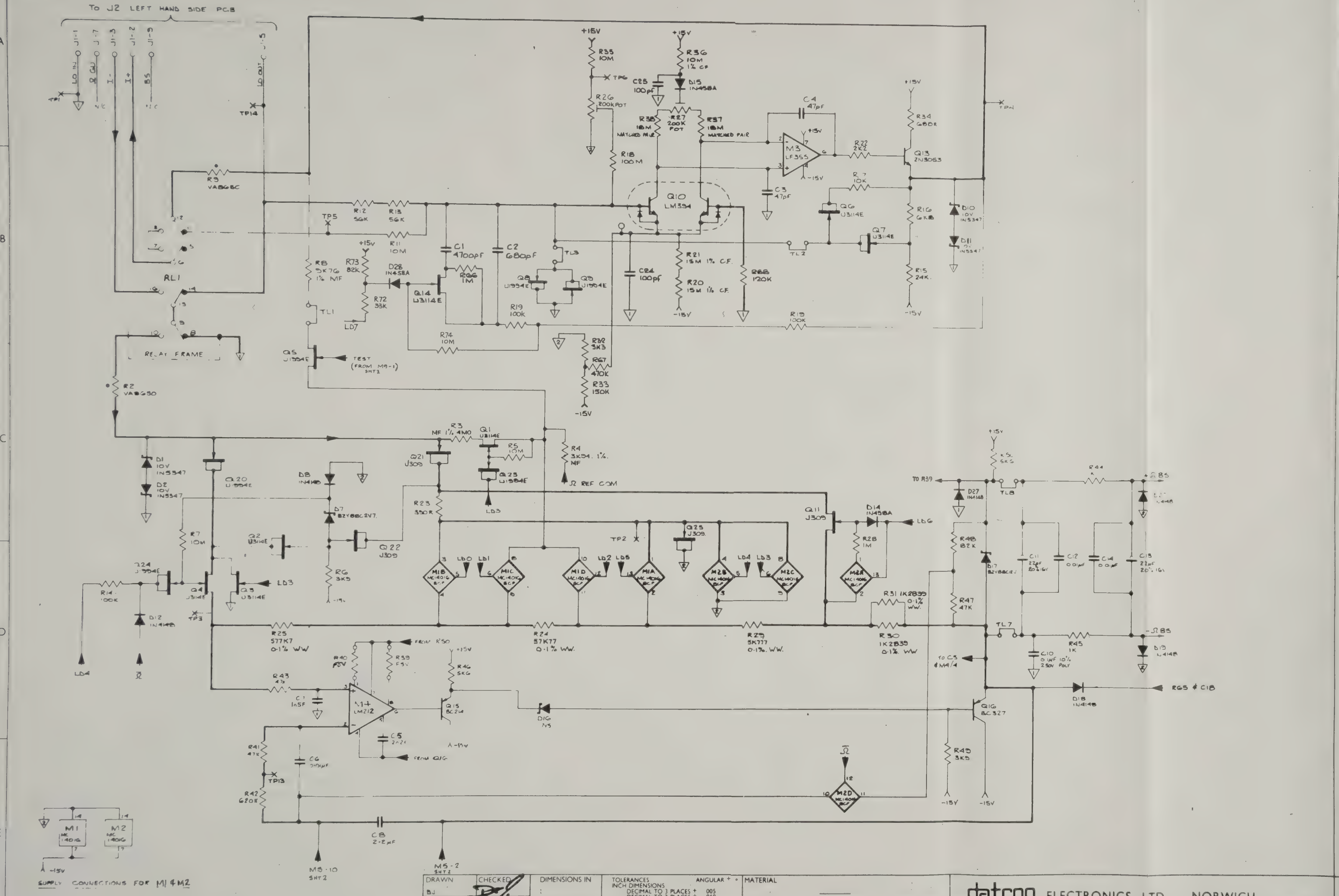
DRAWING No.
430331.
FIRST USED ON
1061.

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES



TO J2 LEFT HAND SIDE PCB
J1-1 LO Ω
J1-7 R CAL
J1-3 I-
J1-2 I+
J1-9 BS
J1-5 LO OUT
TP1
TP14
R9 VA868C
RL1
RELAY FRAME
R2 VA8650
+15V
R35 10M
TP6
R26 200K POT
C25 100pF
R36 10M 1% C.F.
D15 1N458A
R38 18M MATCHED PAIR
R27 200K POT
R37 18M MATCHED PAIR
R18 100M
C4 47pF
M3 LF355
R22 2K2
Q13 2N3053
R34 680R
TP4
Q10 LM394
C3 47pF
R7 10K
Q6 U3114E
D10 10V 1N5347
D11 10V 1N5347
R16 6K8
Q7 U3114E
R15 24K
-15V
TP5
R12 56K
R13 56K
R11 10M
R8 5K76 1% MF
R73 82K
D28 1N458A
R72 33K
Q14 U3114E
C1 4700pF
R66 1M
C2 680pF
TL3
Q8 U1994E
Q9 U1994E
C24 100pF
R21 15M 1% C.F.
R20 15M 1% C.F.
R68 120K
TL2
TL1
LD7
R19 100k
R74 10M
R19 100K
Q5 U1994E
TEST (FROM M9-1) SHT 3
R32 3K3
R67 470K
R33 150K
R3 MF 1% 4M0
Q1 U3114E
R5 10M
R4 3K94 1% MF
Ω REF COM
Q21 J309
Q23 U1994E
LD3
D1 10V 1N5347
D2 10V 1N5347
Q20 U1994E
D8 1N4148
D7 BZY88C2V7
R23 330R
R6 3K9
Q2 U3114E
Q22 J309
R7 10M
Q24 U1994E
Q4 U1994E
Q3 U3114E
LD3
R14 100K
D12 1N4148
TP3
TP2
Q25 J309
M1B MC14016 BCP
M1C MC14016 BCP
M1D MC14016 BCP
M1A MC14016 BCP
M2B MC14016 BCP
M2C MC14016 BCP
M2A MC14016 BCP
LD0 LD1 LD2 LD5 LD4 LD3
Q11 J309
D14 1N458A
LD6
R28 1M
R25 577K7 0.1% WW
R24 57K77 0.1% WW
R29 5K777 0.1% WW
R30 1K2839 0.1% WW
R31 1K2839 0.1% WW
TO R39
D27 1N4148
TL8
R44
+Ω BS
R48 82K
D17 BZY88C6V2
C11 22μF 20V
C12 0.01μF
C14 0.01μF
C13 22μF 20V
R47 47K
TL7
-Ω BS
C10 0.1μF 10% 250V POLY
R45 1K
D19 1N4148
TO C5 & M4/4
D18 1N4148
R65 & C18
Q16 BC327
R49 3K9
LD4
Ω
R43 47K
C1 1n5F
R40
R39
FROM R50
+15V
R46 5K6
M4 LM212
Q15 BC214
D16
C5
FROM Q16
R41 47K
C6
TP13
R42 620K
Ω
M2D MC14016 BCP
C8 2.2μF
M5-10 SHT 2
M5-2 SHT 2
M1 MC 14016
M2 MC 14016
-15V
SUPPLY CONNECTIONS FOR M1 & M2

ISS.	CHANGES
1	RELEASED
2	D23 WAS 1N4148 BJ R56 1M 4-5-79 C19 " 0.1μF
3	ECO 856 D24 BJ DELETED 20-6-79. ECO 909 D7, C3V3 NOW C2V7 R6 10K NOW 3K9 R15 15K NOW 24K
4	ECO 950 RE-INSTATE D23 ECO 958 Q21, Q22 & Q25 U1994E's NOW J309's BJ 13-7-79
5	ECO 1054 & 1062 Q12 DELETED R32 WAS 2K7 R26 WAS 2M R36 WAS 18M R67 ADDED PCB NOW ISS.4. TL6 & TP7 DELETED R32 FSVS DELETED R35 WAS 1M5 R66 & R68 ADDED C24 & C25 ADDED W.G.S. 6 FEB 80
6	SEE SHEET 2
7	ECO 1124 C7 WAS 3n3F 3.6.80
8	ECO 1134 D27 ADDED 19.6.80
9	ECO 1176 R72 R73 R74 & D28 ADDED R10 DELETED R26 WAS 20k R35 WAS 1M2 SEE ALSO SHEET 2 12 12 80

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	MATERIAL
BJ		MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 ANGULAR ± °	——
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	FINISH
DATE 20-4-79.	DATE	NOT TO BE SCALED		——

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE A1

TITLE: OHMS PCB CIRCUIT 1061.

DRAWING No. 430331.

SHEET 1 OF 2

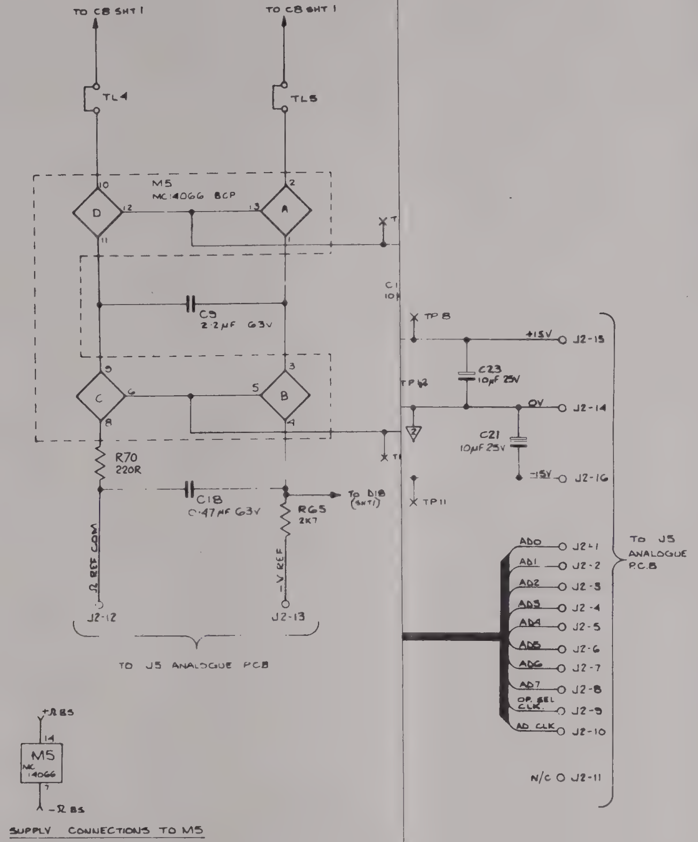
1 | 2 | 7

DRAWING No.
430331.
FIRST USED ON
1061

THIRD ANGLE P
DRAWN IN ACCORDANCE WITH BS 3

NOTES

ISS.	CHANGES
1	RELEASED.
2.	D23 WAS 1N4148. B.J. R56 WAS 1M. ECO867. C13 " 0·1µF. 11-5-79.
3	ECO 898. D24 B.J. DELETED. 20-6-79. ECO 909. D7, C6V8 NOW C2V7. R6, 10K NOW 3K9. R15, 16K NOW 24K.
4	ECO 930 RE-INSTATE D2 ECO 933 Q21, Q22 & Q2 U1994E'S NOW J309's B.J. 13-7-79.
5	ECO 1084 & 1082 SEE SHT 1 FOR DETAILS W.G.S. 6 FEB 80
6	ECO.1109 C26 ADDED IL 21.4.80
7	ECO. 1115. C28 WAS 1nF R69 ADDED. IL 3.6.80
8	ECO. 1184 R70 ADDED IL 19.6.80
9	ECO.1176 R71 & C27 ADDED IL 12.12.80


TO CB SHT 1
TO CB SHT 1
TL4
TL5
M5
MC14066 BCP
D
A
10
12
13
2
11
1
C1
10
C9
2.2µF 63V
C
B
9
6
5
3
8
4
R70
220R
C18
0.47µF 63V
To D18 (SHT1)
R65
2K7
Ω REF COM
−V REF
J2-12
J2-13
TO J5 ANALOGUE PCB
TP8
+15V
J2-15
C23
10µF 25V
TP12
0V
J2-14
C21
10µF 25V
−15V
J2-16
TP11
AD0
J2-1
AD1
J2-2
AD2
J2-3
AD3
J2-4
AD4
J2-5
AD5
J2-6
AD6
J2-7
AD7
J2-8
OP. SEL CLK.
J2-9
AD CLK
J2-10
N/C
J2-11
To J5 ANALOGUE P.C.B
+ΩBS
14
M5
MC 14066
7
−Ω BS

SUPPLY CONNECTIONS TO M5

RANGE TRUTH TABLE

		LD0	LD1	LD2	LD3	LD4	LD5	LD6	LD7
RANGE	10Ω	0	0	0	0	0	0	1	X
	100Ω	0	0	0	0	0	0	1	X
	1KΩ	0	0	0	0	0	1	0	X
	10KΩ	1	0	0	0	0	0	0	X
	100KΩ	0	0	0	0	1	0	0	X
	1MΩ	0	0	1	1	0	0	0	X
	10MΩ	0	1	0	1	0	0	0	X
FILTER		X	X	X	X	X	X	X	1
$\overline{\Omega}$		0	0	0	0	0	0	0	0

LOGIC 0 = −15V
LOGIC 1 = 0V
LOGIC 'X' = 'DONT CARE' CONDITION

TD. NORWICH.

DRAWING SIZE
A1

DRAWING No.
430331.

SHEET
2 OF

DRAWING No	430331
FIRST USED ON	1061

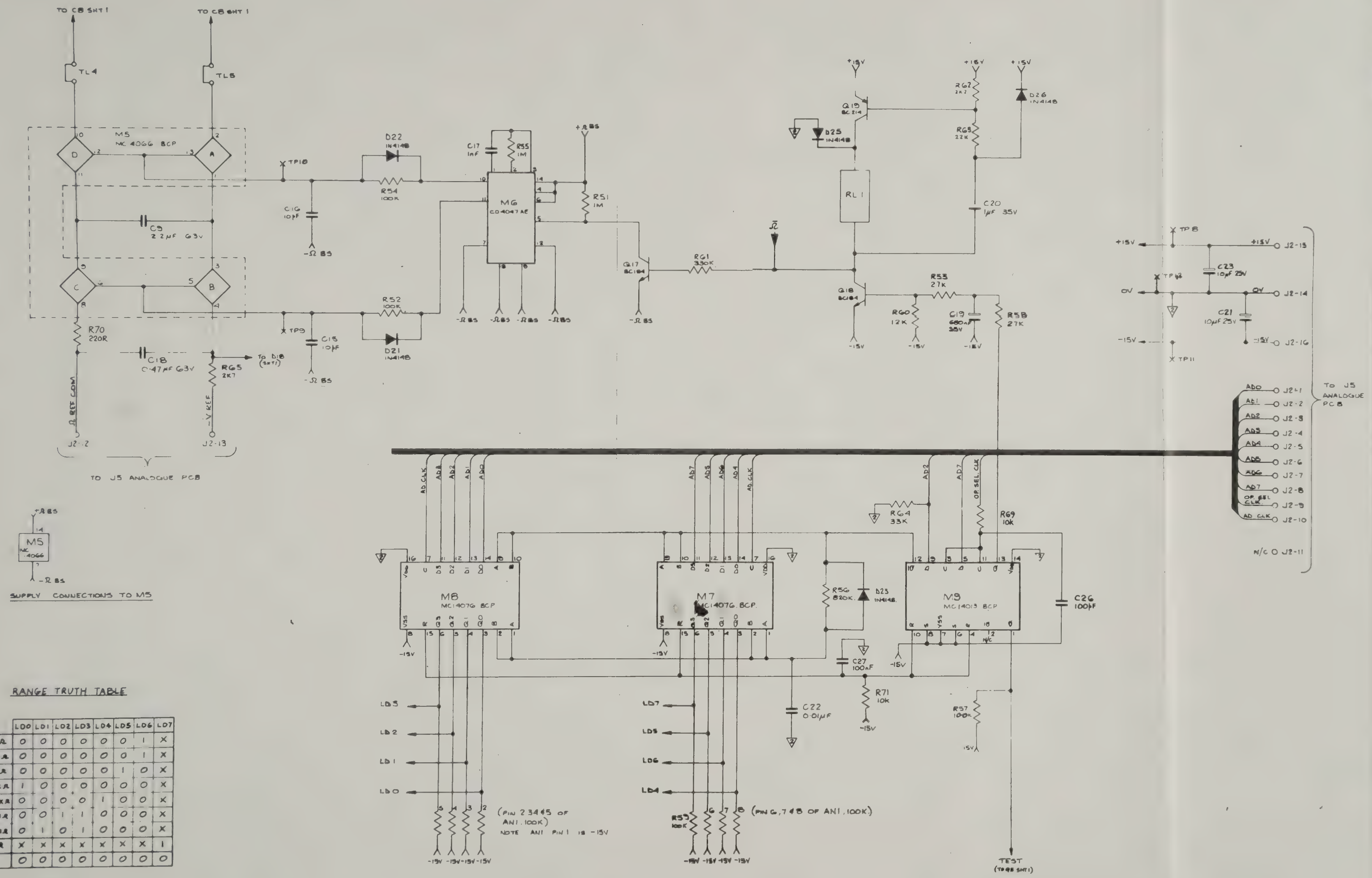
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
1	RELEASED.
2.	D23 WAS 1N4148. BJ. R56 WAS 1M. ECO857. C19 " 0·1µF 11·5·79.
3	ECO 828 D24 BJ. DELETED. 20-6-79. ECO 308. D7, C6V8 NOW C2V7. R6, 10K NOW 3K9 R15, 15K NOW 24K.
4	ECO 930 RE-INSTATE D23 ECO 933 Q21, Q22 & Q23 U1994E'S NOW J305's BJ 13-7-79
5	ECO 1084 & 1082 SEE SHT 1 FOR DETAILS W.G.S. 6 FEB 80
6	ECO 1109 C26 ADDED 21.4.80
7	ECO. 1115. C26 WAS 1nF R69 ADDED. 3.6.80
8	ECO. 1184 R70 ADDED 19.6.80
9	ECO. 1176 R71 & C27 ADDED 12.12.80



TO CB SHT 1
TO CB SHT 1
TL4
TL5
M5
MC 4066 BCP
D
A
C
B
C5
2.2µF 63V
R70
220R
C18
0·47µF 63V
R65
2K7
To D18 (SHT 1)
Ω REF COM
-V REF
J2-2
J2-13
TO J5 ANALOGUE PCB
TP10
TP9
C16
10pF
C15
10pF
-Ω BS
D22
1N4148
R54
100K
R52
100K
D21
1N4148
C17
1nF
R55
1M
M6
CD4047AE
+Ω BS
R51
1M
Q17
BC184
R61
330K
Ω
+15V
Q19
BC214
D25
1N4148
RL1
R62
2K7
R63
22K
D26
1N4148
C20
1µF 35V
Q18
BC184
R53
27K
R60
12K
C19
680nF 35V
R58
27K
-15V
TP8
TP12
TP11
C23
10µF 25V
C21
10µF 25V
+15V
0V
-15V
J2-15
J2-14
J2-16
AD0
AD1
AD2
AD3
AD4
AD5
AD6
AD7
OP SEL CLK
AD CLK
J2-1
J2-2
J2-3
J2-4
J2-5
J2-6
J2-7
J2-8
J2-9
J2-10
N/C
J2-11
TO J5 ANALOGUE PCB
SUPPLY CONNECTIONS TO M5
M5
MC 4066
+Ω BS
-Ω BS
M8
MC14076 BCP
M7
MC14076 BCP
M9
MC14013 BCP
R64
33K
R69
10K
R56
820K
D23
1N4148
C26
100pF
C27
100nF
R71
10K
C22
0.01µF
R57
100K
LD5
LD2
LD1
LD0
LD7
LD3
LD6
LD4
R53
100K
(PIN 2 3 4 & 5 OF AN1 100K)
NOTE AN1 PIN 1 IS -15V
(PIN 6, 7 & 8 OF AN1, 100K)
-15V -15V -15V -15V
TEST
(TO Q8 SHT 1)

RANGE TRUTH TABLE

		LD0	LD1	LD2	LD3	LD4	LD5	LD6	LD7
RANGE	10Ω	0	0	0	0	0	0	1	X
	100Ω	0	0	0	0	0	0	1	X
	1KΩ	0	0	0	0	0	1	0	X
	10KΩ	1	0	0	0	0	0	0	X
	100KΩ	0	0	0	0	1	0	0	X
	1MΩ	0	0	1	1	0	0	0	X
	10MΩ	0	1	0	1	0	0	0	X
FILTER		X	X	X	X	X	X	X	1
$\overline{\Omega}$		0	0	0	0	0	0	0	0

LOGIC 0 = -15V
LOGIC 1 = 0V
LOGIC X = 'DONT CARE' CONDITION

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES	MATERIAL
BJ		MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 ANGULAR ± °	——
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm	FINISH
DATE 20-4-79	DATE	NOT TO BE SCALED	UNLESS OTHERWISE STATED	——

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE A1

TITLE OHMS PCB CIRCUIT. 1061.

DRAWING No. 430331.

SHEET 2 OF

400332

THIRD ANG

		HANGES
	1	RELEASED TO PRODN IL 1.2.80
AJ	2	ECO 1078 TEST POINTS TP1 - TP9 ADDED J3 PINS RE-ORGANISED PCB WAS ISS 3 IL 22.2.80
AJ	3	ECO 1093 PARTS LIST CHANGE IL 26.3.80
	4	ECO 1137 PARTS LIST CHANGE IL 28.7.80

A

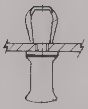
MOUNT M1 ON 40WAY
DIL SOCKET 605050

AY
64 3 OFF

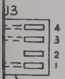
B

PCB 410100-

NYLATCH-GROMMET *
617011 - 6 OFF



- 3 OFF



NYLATCH-PLUNGER *
617010 - 6 OFF
N.B. FIT FROM COMPONENT
SIDE OF PCB

SECTION A-A

4 WAY CONNECTOR
605051

KET

MOUNT M2 ON 8WAY
DIL SOCKET 605059

MO IN
DIL S

CIRCUIT DIAGRAM = 430332

RONICS LTD NORWICH

)GRAM PCB ASSY

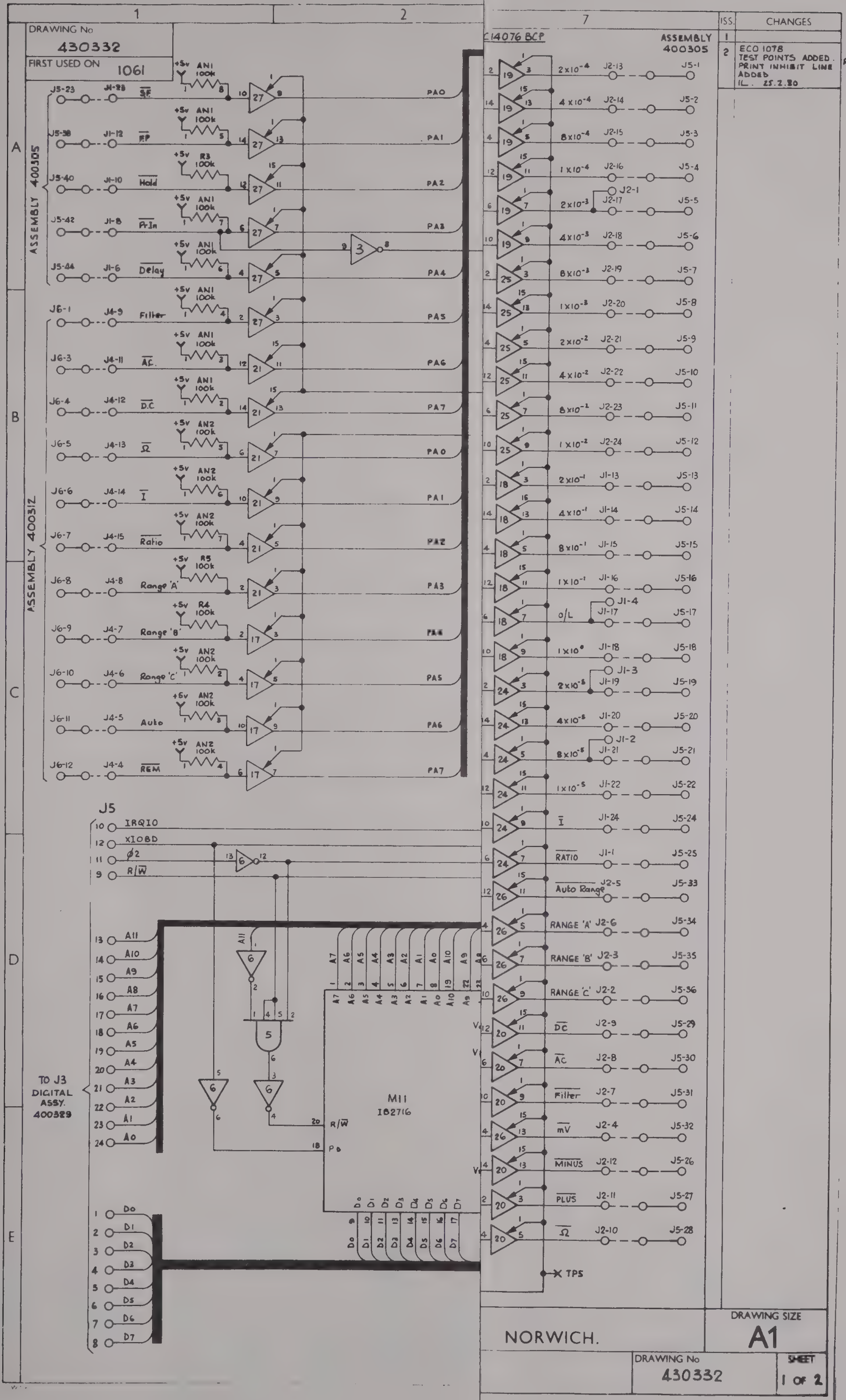
DRAWING SIZE
A1

DRAWING No
400332

SHEET
1 OF 4

DRAWING No 430332

FIRST USED ON 1061



ASSEMBLY 400305
ASSEMBLY 400312
C14076 BCP
ASSEMBLY 400305
J5-23 J1-23 SF
J5-38 J1-12 RP
J5-40 J1-10 Hold
J5-42 J1-8 PrIn
J5-44 J1-6 Delay
J6-1 J4-9 Filter
J6-3 J4-11 AC.
J6-4 J4-12 D.C
J6-5 J4-13 Ω
J6-6 J4-14 I
J6-7 J4-15 Ratio
J6-8 J4-8 Range 'A'
J6-9 J4-7 Range 'B'
J6-10 J4-6 Range 'C'
J6-11 J4-5 Auto
J6-12 J4-4 REM
+5v AN1 100k
+5v R3 100k
+5v AN2 100k
+5v R5 100k
+5v R4 100k
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
2x10⁻⁴ J2-13 J5-1
4x10⁻⁴ J2-14 J5-2
8x10⁻⁴ J2-15 J5-3
1x10⁻⁴ J2-16 J5-4
2x10⁻³ J2-1 J2-17 J5-5
4x10⁻³ J2-18 J5-6
8x10⁻³ J2-19 J5-7
1x10⁻³ J2-20 J5-8
2x10⁻² J2-21 J5-9
4x10⁻² J2-22 J5-10
8x10⁻² J2-23 J5-11
1x10⁻² J2-24 J5-12
2x10⁻¹ J1-13 J5-13
4x10⁻¹ J1-14 J5-14
8x10⁻¹ J1-15 J5-15
1x10⁻¹ J1-16 J5-16
O/L J1-4 J1-17 J5-17
1x10⁰ J1-18 J5-18
2x10⁻⁵ J1-3 J1-19 J5-19
4x10⁻⁵ J1-20 J5-20
8x10⁻⁵ J1-2 J1-21 J5-21
1x10⁻⁵ J1-22 J5-22
I J1-24 J5-24
RATIO J1-1 J5-25
Auto Range J2-5 J5-33
RANGE 'A' J2-6 J5-34
RANGE 'B' J2-3 J5-35
RANGE 'C' J2-2 J5-36
DC J2-9 J5-29
AC J2-8 J5-30
Filter J2-7 J5-31
mV J2-4 J5-32
MINUS J2-12 J5-26
PLUS J2-11 J5-27
Ω J2-10 J5-28
TPS
J5
10 IRQ10
12 XIOBD
11 Ø2
9 R/W
A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
D0 D1 D2 D3 D4 D5 D6 D7
TO J3 DIGITAL ASSY. 400329
M11 1B2716
R/W
P0

ISS.	CHANGES
1	
2	ECO 1078 TEST POINTS ADDED. PRINT INHIBIT LINE ADDED IL. 25.2.80

A.J

NORWICH.

DRAWING SIZE A1

DRAWING No 430332

SHEET 1 OF 2

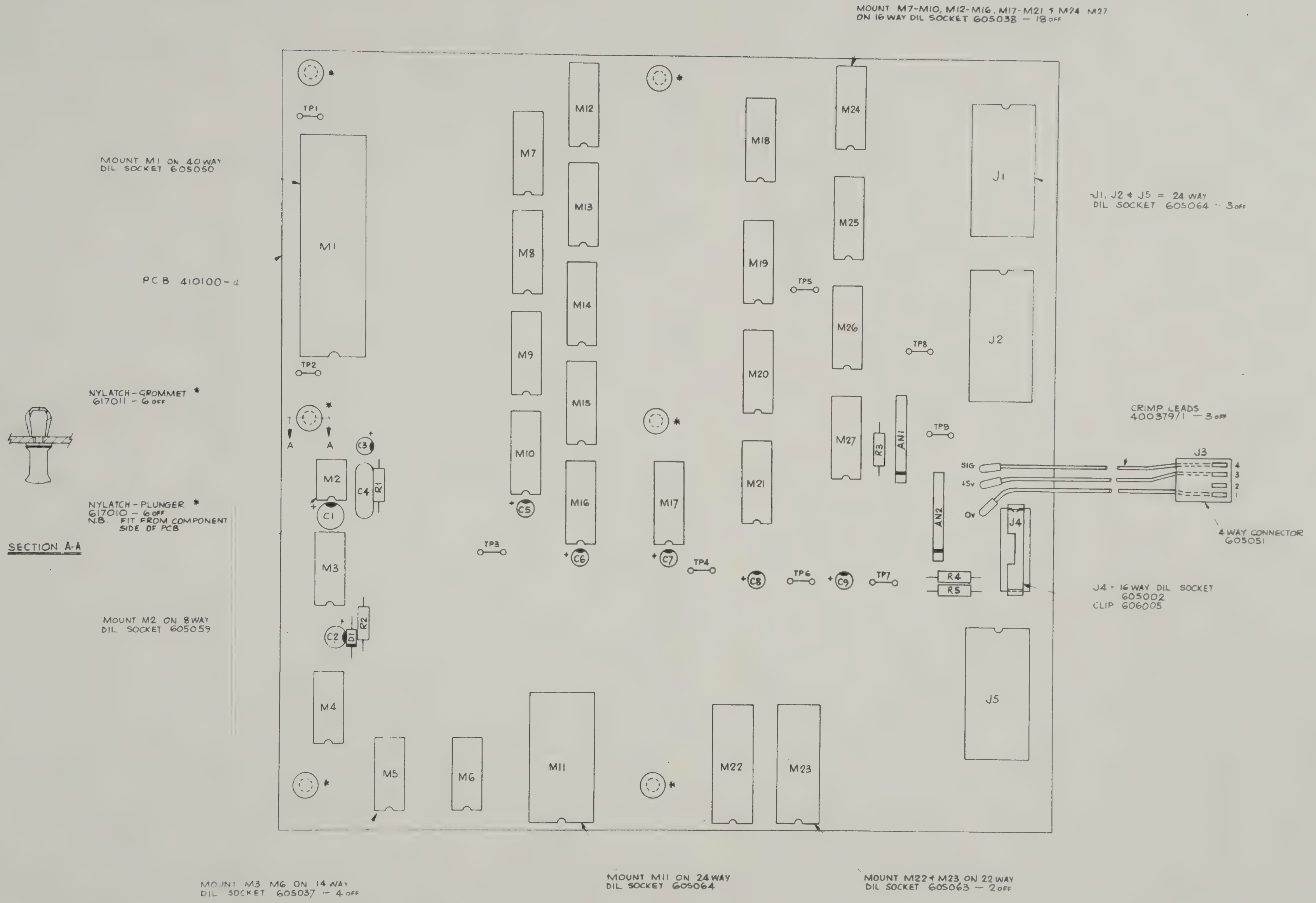
400332

THIRD ANGLE PROJECTION

	CHANGES
1	RELEASED TO PRODN IL 1.2 80
2	ECO 1078 TEST POINTS TP1 TP9 ADDED J3 PINS RE-ORGANISED PCB WAS ISS 3 IL 22.2.80
3	ECO 1093 PARTS LIST CHANGE IL 26.3 80
4	ECO 1137 PARTS LIST CHANGE IL 28.7.80

GJ

AJ


MOUNT M7-M10, M12-M16, M17-M21 & M24 M27 ON 16 WAY DIL SOCKET 605038 — 18 OFF
MOUNT M1 ON 40 WAY DIL SOCKET 605050
PCB 410100-4
NYLATCH-GROMMET * 617011 — 6 OFF
NYLATCH-PLUNGER * 617010 — 6 OFF
N.B. FIT FROM COMPONENT SIDE OF PCB
SECTION A-A
MOUNT M2 ON 8 WAY DIL SOCKET 605059
J1, J2 & J5 = 24 WAY DIL SOCKET 605064 — 3 OFF
CRIMP LEADS 40037971 — 3 OFF
J3
SIG
+5V
0V
4
3
2
1
4 WAY CONNECTOR 605051
J4 = 16 WAY DIL SOCKET 605002
CLIP 606005
MOUNT M3 M6 ON 14 WAY DIL SOCKET 605037 — 4 OFF
MOUNT M11 ON 24 WAY DIL SOCKET 605064
MOUNT M22 & M23 ON 22 WAY DIL SOCKET 605063 — 2 OFF
M1
M2
M3
M4
M5
M6
M7
M8
M9
M10
M11
M12
M13
M14
M15
M16
M17
M18
M19
M20
M21
M22
M23
M24
M25
M26
M27
J1
J2
J4
J5
C1
C2
C3
C4
C5
C6
C7
C8
C9
R1
R2
R3
R4
R5
D1
AN1
AN2
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
A
A

CIRCUIT DIAGRAM = 430332

IL

AL 1 80

2:1

ANGULAR

MATERIAL

FINISH

datron ELECTRONICS LTD NORWICH

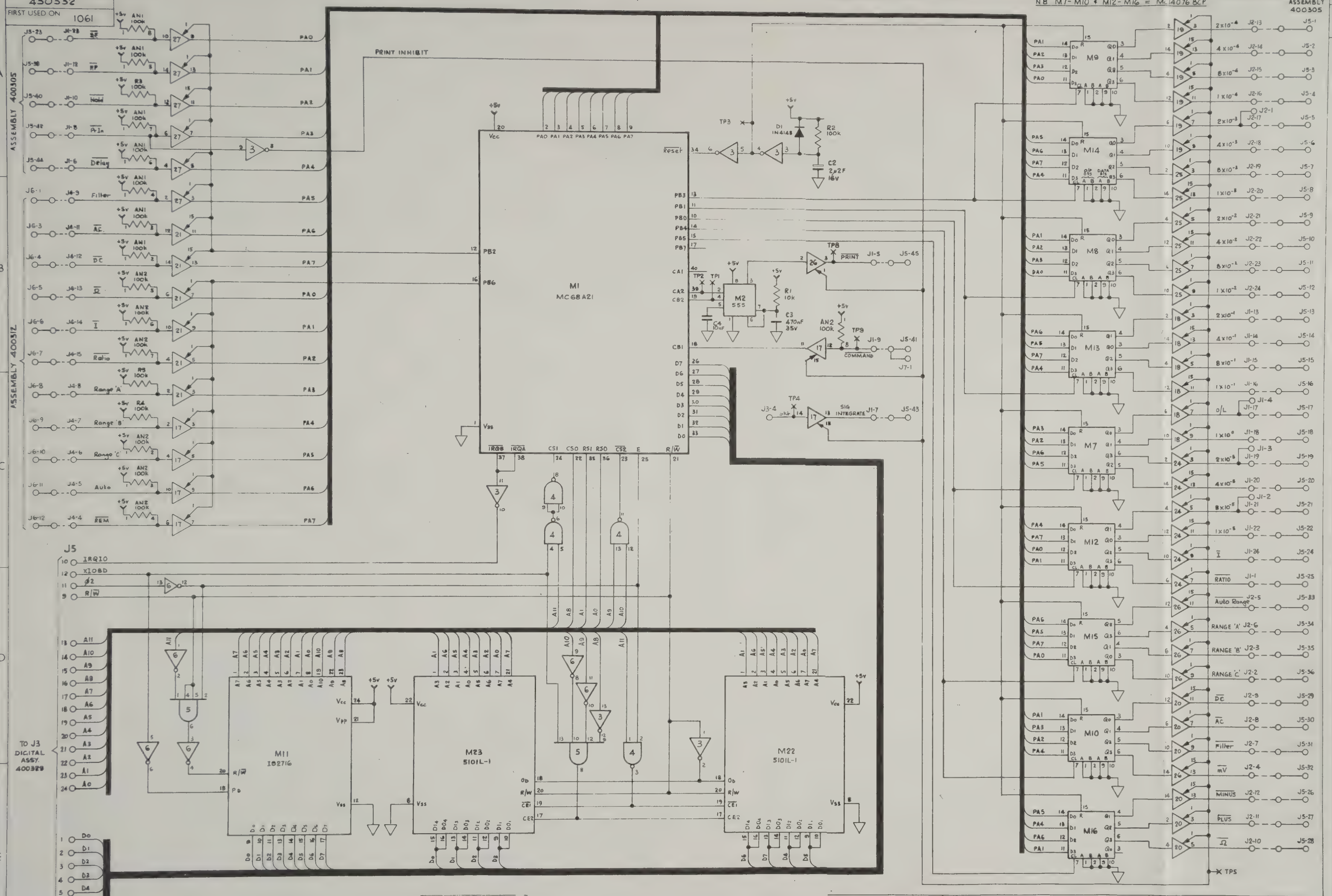
BCD/PROGRAM PCB ASSY

DRAWING SIZE
A1

DRAWING No
400332

SHEET
1 OF 4

DRAWING No
430332
FIRST USED ON 1061


NB M7-M10 + M12-M16 = MC14076 BCP
M1 MC68A21
M2 555
M11 2716
M23 5101L-1
M22 5101L-1
M9
M14
M8
M13
M7
M12
M15
M10
M16
PRINT INHIBIT
PRINT
COMMAND
SIG INTEGRATE
ASSEMBLY 400305
ASSEMBLY 400312
ASSEMBLY 400305
TO J3 DIGITAL ASSY 400329
J5
IRQ10
XIOBD
Ø2
R/W
Reset
TP1
TP2
TP3
TP4
TP8
TP9
TP5
D1 1N4148
R2 100k
C2 2μ2F 16V
R1 10k
C3 470nF 35V
C4 10nF
AN2 100k
Delay
Filter
AC
DC
Ratio
Range 'A'
Range 'B'
Range 'C'
Auto
REM
2x10⁻⁴
4x10⁻⁴
8x10⁻⁴
1x10⁻⁴
2x10⁻³
4x10⁻³
8x10⁻³
1x10⁻³
2x10⁻²
4x10⁻²
8x10⁻²
1x10⁻²
2x10⁻¹
4x10⁻¹
8x10⁻¹
1x10⁻¹
O/L
1x10⁰
2x10⁰
4x10⁰
8x10⁰
1x10¹
RATIO
Auto Range
RANGE 'A'
RANGE 'B'
RANGE 'C'
DC
AC
Filter
mV
MINUS
PLUS
Ω

ISS	CHANGES
1	
2	ECO 1078 TEST POINTS ADDED PRINT INHIBIT LINE ADDED IL 25.2.80

A.J

DRAWN	CHECKED
IL	A.J.
TRACED	APPROVED
DATE 11.2.80	DATE

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE A1

TITLE BCD / PROGRAM

DRAWING No 430332

SHEET 1 OF 2

DRAWING No
430332

FIRST USED ON 1061

THIRD ANG

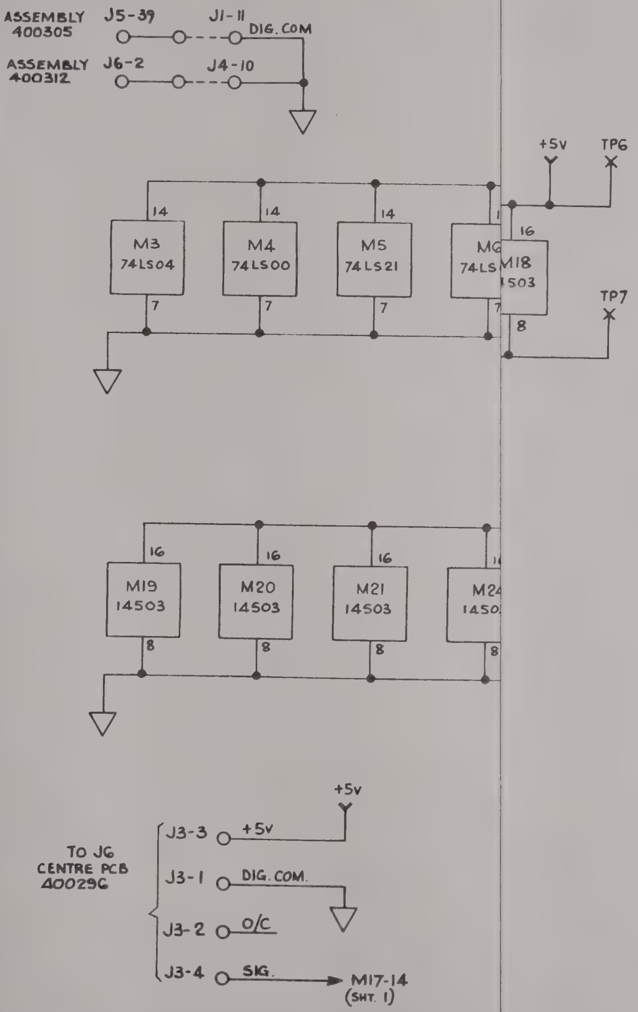
DRAWN IN ACCORDANC

NOTES

ISS.	CHANGES
1	
2	TPG ◂ TP7 ADDED IL 22.2.80

A.J.

NB ALL RESISTORS SHOWN ON SHEET 1
= 5% 1/4 W. CARBON FILM



ASSEMBLY 400305
J5-39
J1-11
DIG. COM
ASSEMBLY 400312
J6-2
J4-10
+5V
TP6
14
M3
74LS04
7
14
M4
74LS00
7
14
M5
74LS21
7
M6
74LS
7
16
M18
14503
8
TP7
16
M19
14503
8
16
M20
14503
8
16
M21
14503
8
M24
1450
8
+5v
TO J6
CENTRE PCB
400296
J3-3
+5v
J3-1
DIG. COM.
J3-2
O/C
J3-4
SIG.
M17-14
(SHT. 1)

DRAWN IL	DATE 11.2.80	DIMENSIONS IN MILLIMETRES	METRIC DIMENSIONS ANGULAR ± ½° DECIMAL TO 2 PLA DECIMAL TO 1 PLA WHOLE DIMENSION UNLESS OTHERWISE ST
CHKD. A.J.	DATE 25.2.80	SCALE NOT TO BE SCALED	
APPD.	DATE		

DRAWING SIZE
A2

DRAWING No
430332

SHEET
2 OF [illegible]

DRAWING No
430332
FIRST USED ON 1061

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308

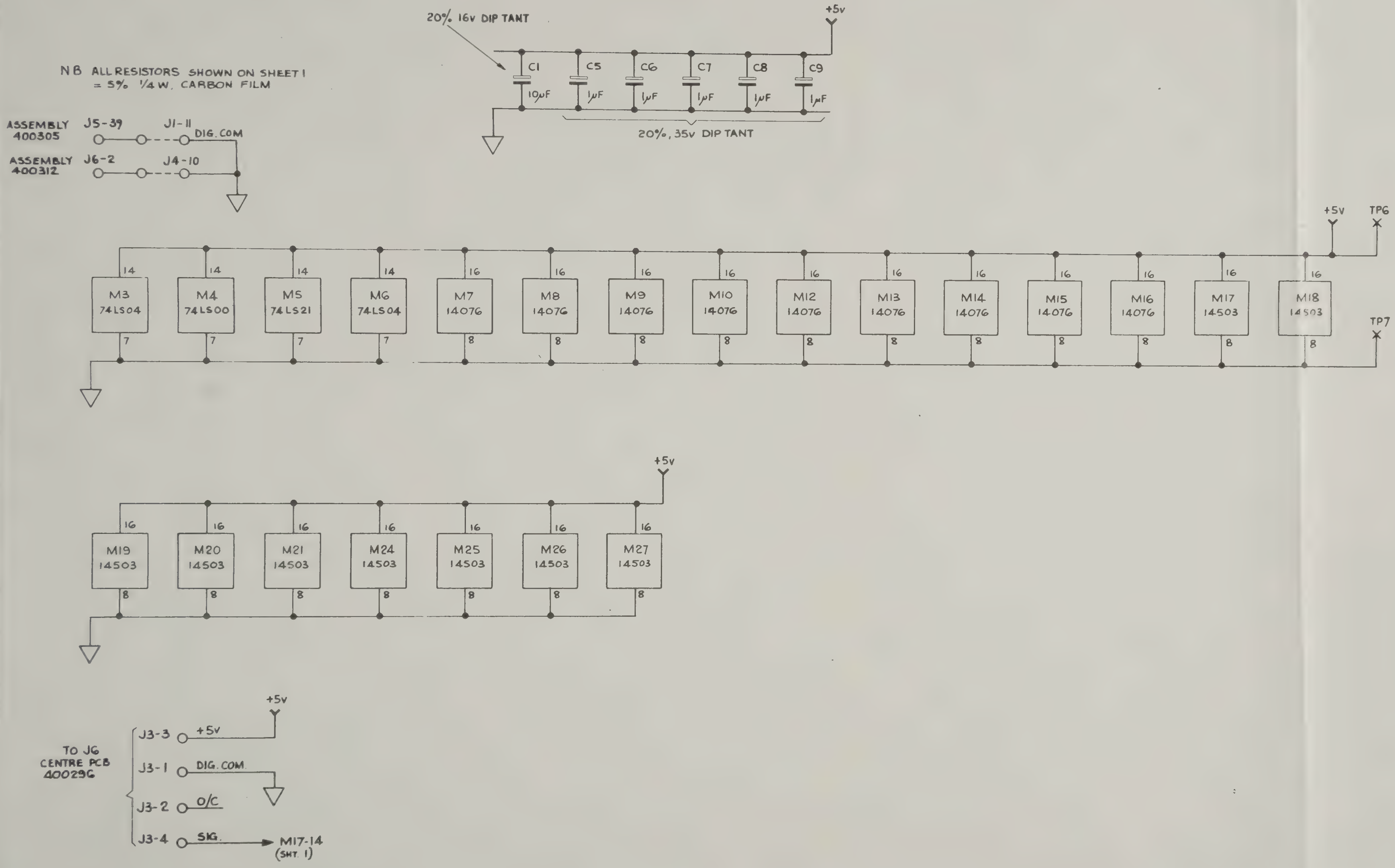
ALL BURRS TO BE REMOVED

NOTES

ISS.	CHANGES
1	
2	TP6 & TP7 ADDED IL 22.2.80

A.J.

NB ALL RESISTORS SHOWN ON SHEET 1
= 5% 1/4 W. CARBON FILM



20% 16v DIP TANT
+5v
C1
10μF
C5
1μF
C6
1μF
C7
1μF
C8
1μF
C9
1μF
20%, 35v DIP TANT
ASSEMBLY 400305
J5-39
J1-11
DIG. COM
ASSEMBLY 400312
J6-2
J4-10
+5v
TP6
M3 74LS04
M4 74LS00
M5 74LS21
M6 74LS04
M7 14076
M8 14076
M9 14076
M10 14076
M12 14076
M13 14076
M14 14076
M15 14076
M16 14076
M17 14503
M18 14503
14
7
16
8
TP7
+5v
M19 14503
M20 14503
M21 14503
M24 14503
M25 14503
M26 14503
M27 14503
16
8
+5v
TO J6 CENTRE PCB 400296
J3-3
+5v
J3-1
DIG. COM
J3-2
O/C
J3-4
SIG.
M17-14 (SHT. 1)

DRAWN	DATE	DIMENSIONS IN	METRIC DIMENSIONS	MATERIAL
IL	11. 2. 80	MILLIMETRES	ANGULAR ± ½°	
CHKD. A.J.	DATE 25. 2. 80	SCALE	DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	FINISH
APPD.	DATE	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE
A2

TITLE
BCD/PROGRAM

DRAWING No
430332

SHEET
2 OF

DRAWING No.	
400386	
FIRST USED ON	1061/1071

THIRD AN

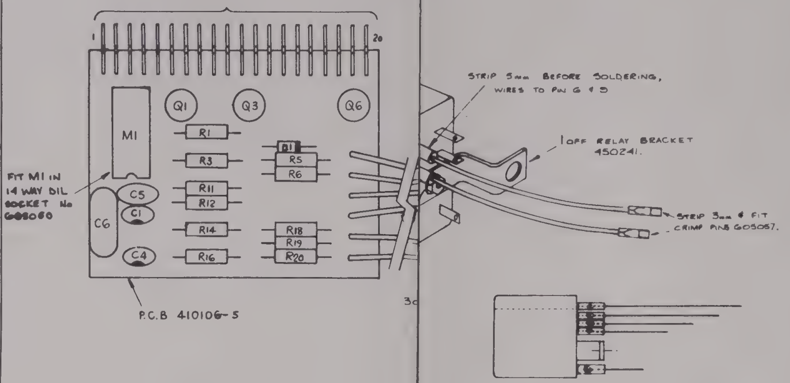
DRAWN IN ACCORDAN

NOTES

IMPORTANT.

FOR CRIMP PINS USE TOOL N° HTR2262A.

ISS.	CHANGES
A	
1	RELEASED TO PRODUCTION 17-5-79
2	ECO. 972 & 995. RL1 & RL2 WERE ITT. 460257 WAS 460185 HALF PLUG 630001 DELETED. EJ. 25-10-79
3	ECO. 981. 6-11-79. R11 & R12 ADDED M1 & SOCKET ADDED. 1OFF 400079/4 ADDED. DELETE D5. PLS'S UPDATED. BJ.
4	ECO 1034. BJ R12 MOVED & WAS 33K. 2-1-80.
5	ECO. 1085 POLARISING KEY FOR J3 REMOVED. J5 REMOVED - SEE SHEET 2 IL 22.4.80
6	ECO. 1167, 1154 R10, R14, R16, R18, R19, R20 C4 C5 C6 D5 D6 D7 + Q6 ADDED. IL 23.9.80
7	ECO 1193 R10 WAS 12K JR 24.2.81


J1
1
20
Q1
Q3
Q6
M1
R1
R3
R5
R6
R11
R12
R14
R16
R18
R19
R20
C5
C1
C6
C4
FIT M1 IN
14 WAY DIL
SOCKET No
605050
P.C.B 410106-5
STRIP 5mm BEFORE SOLDERING,
WIRES TO PIN 6 & 5
1 OFF RELAY BRACKET
450241.
STRIP 3mm & FIT
CRIMP PINS 605057.
3c

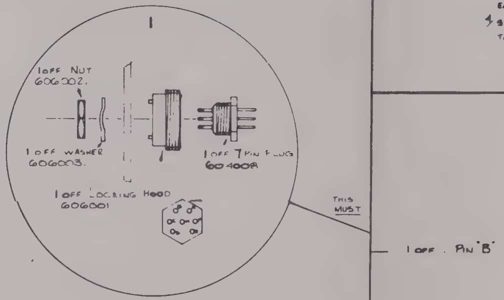
PROCEDURE

1/ FIT BOTH RELAYS TO THE BRACKET (AS SHOWN) WITH WASHER & NUT

2/ ON PINS 6 & 5 OF THE TWO POLE RELAY SOLDER 70mm OF WHITE WIRE PART No 540008 SLEEVE WITH ½ PIECE OF 530001 (16 .0mm).

3/ ALL OTHER CONTACTS ARE TO HAVE APPROXIMATELY 60mm OF 22 swg TINNED COPPER WIRE PART N° 540002 & SLEEVE EACH WITH ½ PIECE OF 530001.

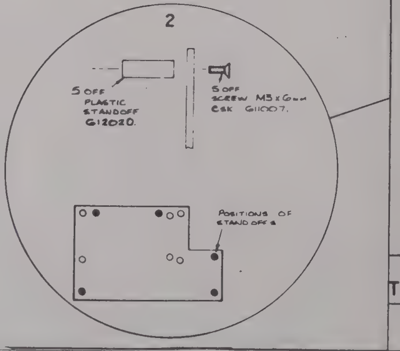
4/ STAGGER LENGTHS OF TINNED COPPER WIRE, TO ASSIST FITTING TO PCB AS SHOWN.


1
1OFF NUT
606002.
1 OFF WASHER
606003.
1 OFF 7 PIN PLUG
604008
1 OFF LOCKING HOOD
606001
THIS
MUST
1 OFF . PIN 'B'

PROCEDURE

1/ ALL PINS ON THE SOCKET EXCEPT PIN B (SHOWN SOLID), SOLDER ON 60mm OF TINNED COPPER WIRE PART N° 540002 & SLEEVE ALL JOINTS WITH APPROXIMATELY 16mm OF SLEEVING PART NO 530001.

THERE SHOULD NOW BE 6 WIRES.


2
5 OFF
PLASTIC
STANDOFF
612020.
5 OFF
SCREW M3x6mm
CSK 611007.
POSITIONS OF
STAND OFFS

TRONICS LTD. NORWICH.

DRAWING SIZE

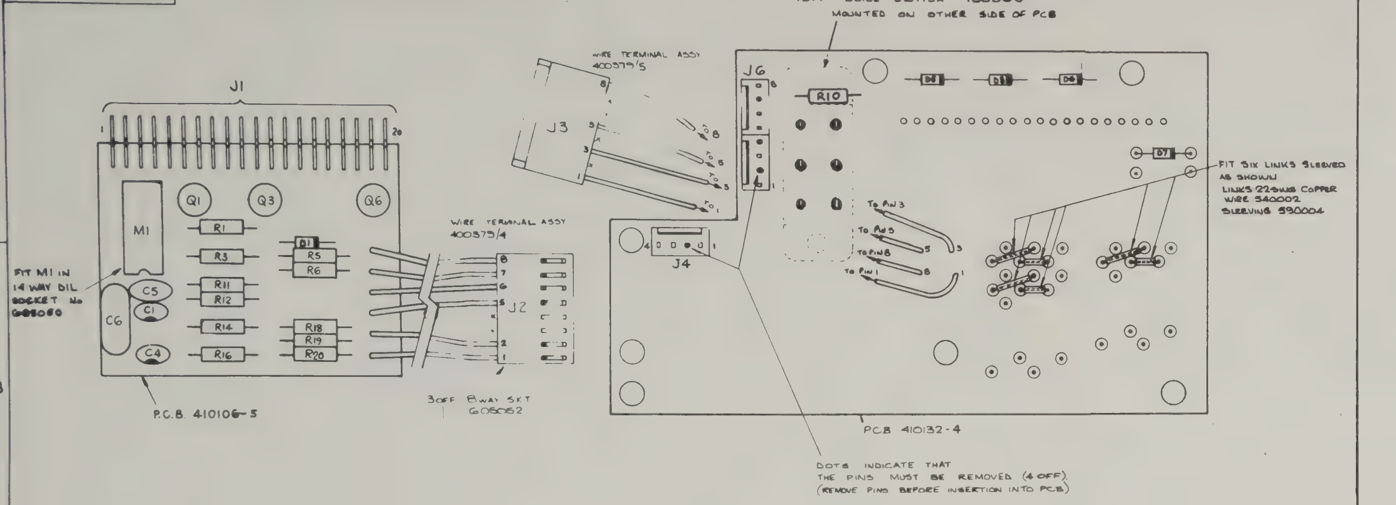
A1

DRAWING No.	SHEET
400386	1 OF 8

DRAWING No.
400386

FIRST USED ON
1061/1071

THIRD ANGLE PROJECTION
DRAWN IN ACCORDANCE WITH BS 308


J1
1
20
Q1
Q3
Q6
M1
R1
R3
D1
R5
R6
R11
R12
R14
R16
R18
R19
R20
C5
C1
C6
C4
FIT M1 IN 14 WAY DIL SOCKET No 608060
P.C.B. 410106-5
WIRE TERMINAL ASSY 400379/4
J2
3OFF 8WAY SKT 605052
WIRE TERMINAL ASSY 400379/5
J3
TO 8
TO 6
TO 5
TO 1
1OFF SLIDE SWITCH 700069 MOUNTED ON OTHER SIDE OF PCB
J6
R10
D5
D6
D7
J4
TO PIN 3
TO PIN 5
TO PIN 8
TO PIN 1
FIT SIX LINKS SLEEVED AS SHOWN
LINKS 22SWG COPPER WIRE 540002
SLEEVING 590004
PCB 410132-4
DOTS INDICATE THAT THE PINS MUST BE REMOVED (4 OFF). (REMOVE PINS BEFORE INSERTION INTO PCB)

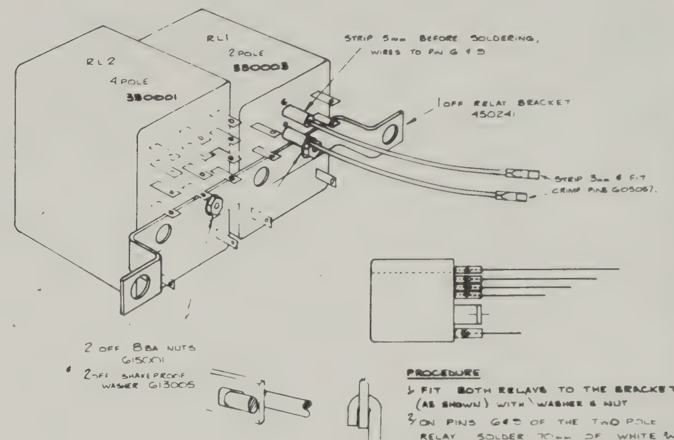
ALL BURRS TO BE REMOVED

NOTES

IMPORTANT.

FOR CRIMP PINS USE TOOL Nº HTR2262A.

ISS.	CHANGES
A	
1	RELEASED TO PRODUCTION 11-5-79 W.A.S
2	ECO 972 & 995. RL1 & RL2 WERE ITT 450257 WAS 450186 HOLE PLUG 630001 DELETED BJ 25-10-79
3	ECO [illegible] 6-11-79 R11 & R12 ADDED M1 & SOCKET ADDED. 1OFF 400379/4 ADDED. DELETE D5. PCB'S UPDATED. B.J.
4	ECO 1034 B.J R12 MOVED & WAS 33K. 2-1-80.
5	ECO 1085 POLARISING KEY FOR J3 REMOVED. J5 REMOVED - SEE SHEET 2 IL 22.4.80
6	ECO 1167, 1154 R10, R14, R16, R18, R19, R20 C4 C5 C6 D5 D6 D7 & Q6 ADDED IL 23.9.80
7	ECO 1193 R10 WAS 12K JR 24.2.81


RL2
4 POLE
380001
RL1
2 POLE
380003
STRIP 5mm BEFORE SOLDERING, WIRES TO PIN 6 & 9
1OFF RELAY BRACKET 450241
STRIP 3mm & FIT CRIMP PINS 605057.
2 OFF 8BA NUTS 615001
2OFF SHAKEPROOF WASHER 613005

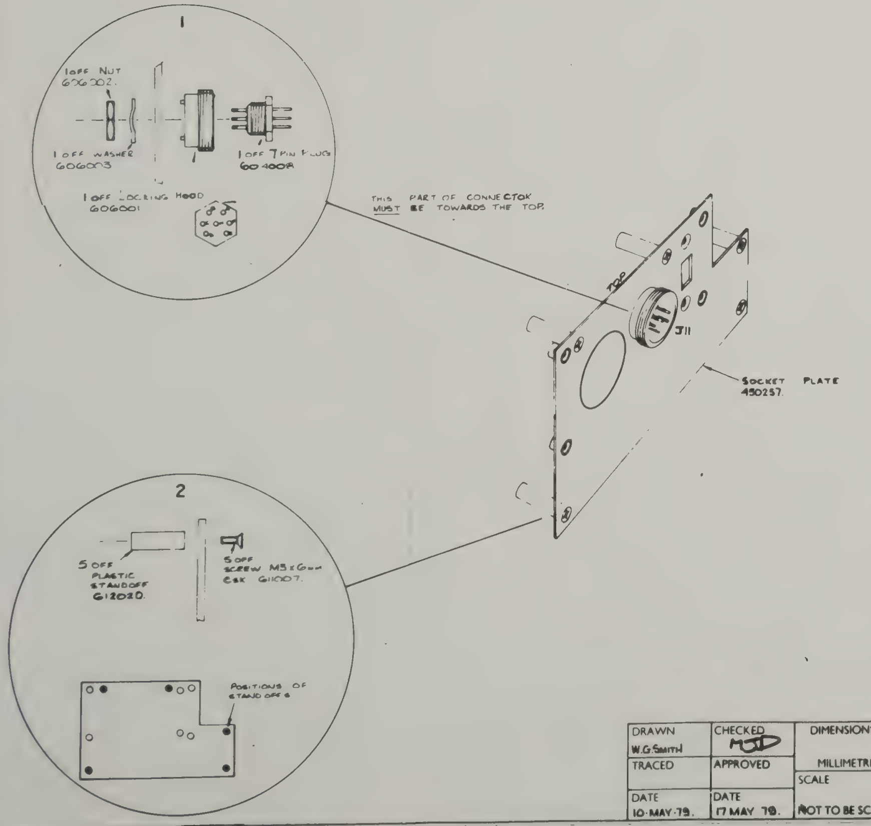
PROCEDURE

1/ FIT BOTH RELAYS TO THE BRACKET (AS SHOWN) WITH WASHER & NUT

2/ ON PINS 6 & 9 OF THE TWO POLE RELAY SOLDER 70mm OF WHITE WIRE PART NO 540008 SLEEVE WITH 1/2 PIECE OF 590001 (10mm).

3/ ALL OTHER CONTACTS ARE TO HAVE APPROXIMATELY 60mm OF 22 SWG TINNED COPPER WIRE PART Nº 540002 & SLEEVE EACH WITH 1/2 PIECE OF 590001.

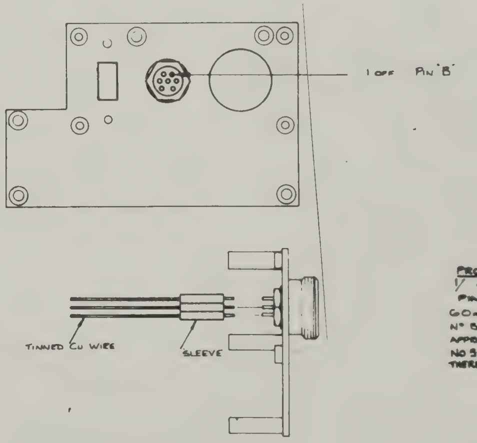
4/ STAGGER LENGTHS OF TINNED COPPER WIRE, TO ASSIST FITTING TO PCB AS SHOWN


1
1OFF NUT 606002.
1 OFF WASHER 606003
1 OFF 7 PIN PLUG 604008
1 OFF LOCKING HOOD 606001
THIS PART OF CONNECTOR MUST BE TOWARDS THE TOP.
TOP
J11
SOCKET PLATE 450257.
2
5 OFF PLASTIC STANDOFF 612020.
5 OFF SCREW M3x6mm CSK 611007.
POSITIONS OF STAND OFFS

PROCEDURE

1/ ASSEMBLE THE 7 PIN PYE PLUG FIRST & ENSURE THAT THE CONNECTOR IS SECURED IN THE POSITION SHOWN.

2/ ASSEMBLE THE 5 STANDOFF'S IN THE POSITION SHOWN BY THE LARGE DOTS.


1 OFF PIN 'B'
TINNED Cu WIRE
SLEEVE

PROCEDURE

1/ ALL PINS ON THE SOCKET EXCEPT PIN B (SHOWN SOLID). SOLDER ON 60mm OF TINNED COPPER WIRE PART Nº 540002 & SLEEVE ALL JOINTS WITH APPROXIMATELY 10mm OF SLEEVING PART No 590001.
THERE SHOULD NOW BE 6 WIRES.

DRAWN W.G.SMITH	CHECKED MJD	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ° INCH DIMENSIONS DECIMAL TO 3 PLACES ± .005 DECIMAL TO 2 PLACES ± .010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL	datron ELECTRONICS LTD. NORWICH.	DRAWING SIZE A1
TRACED	APPROVED	SCALE		FINISH	TITLE REAR INPUT ASSY	DRAWING No. 400386
DATE 10-MAY-79.	DATE 17 MAY 79.	NOT TO BE SCALED				SHEET 1 OF 8

1 | 2 | 7

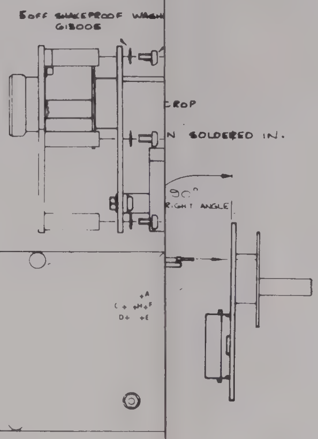
DRAWING No.
400386

FIRST USED ON
1061/71

THIRD ANG
DRAWN IN ACCORDANCE

NOTES

ISS.	CHANGES
A	
1	RELEASED TO PRODUCTION 17 MAY 79 W.A.A.
2	SEE SHEET 1 BJ 25-10-[illegible]
3	SEE SHEET 1 [illegible]
4	SEE SHEET 1. 9-1-[illegible]
5	ECO. 1085 J5 WAS 2 WAY CONN. [illegible] 22.4.80
6	SEE SHEET 1 22.[illegible]
7	SEE SHEET 1 24.8.[illegible]


5OFF SHAKEPROOF WASH
G13006
CROP
N SOLDERED IN.
90°
RIGHT ANGLE
A
C
H
F
D
E

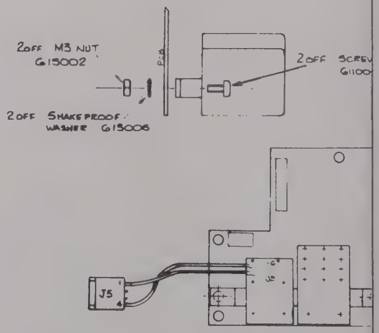
1/ SKETCH BELOW SHOWS THE 2 RELAY & BRACKET ASSEMBLY (FROM SHEET 1). THE CROSSES INDICATE HOLES IN THE PCB INTO WHICH THE WIRES FROM THE RELAYS ARE INSERTED

PROCEDURE

① INSERT THE WIRES INTO THE APPROPRIATE HOLES IN THE PCB (WIRES CUT AT DIFFERENT LENGTHS TO AID ASSEMBLY).

② WHEN THE WIRES ARE ALL IN PLACE SECURE THE BRACKET TO THE PCB USING THE SCREWS, WASHERS & NUTS SHOWN BELOW.

③ SOLDER & CROP WIRES IN THE USUAL MANNER. INSERT THE CRIMP PINS INTO SOCKET J5 PIN 6 OF RELAY TO PIN 4 OF J5 & PIN 9 TO PIN 1 AS SHOWN BELOW


2OFF M3 NUT
G15002
P.C.B
2OFF SCREW
G1100
2OFF SHAKEPROOF WASHER G13006
J5

ONICS LTD. NORWICH.

DRAWING No.
400386

2 of 8

1 2 6

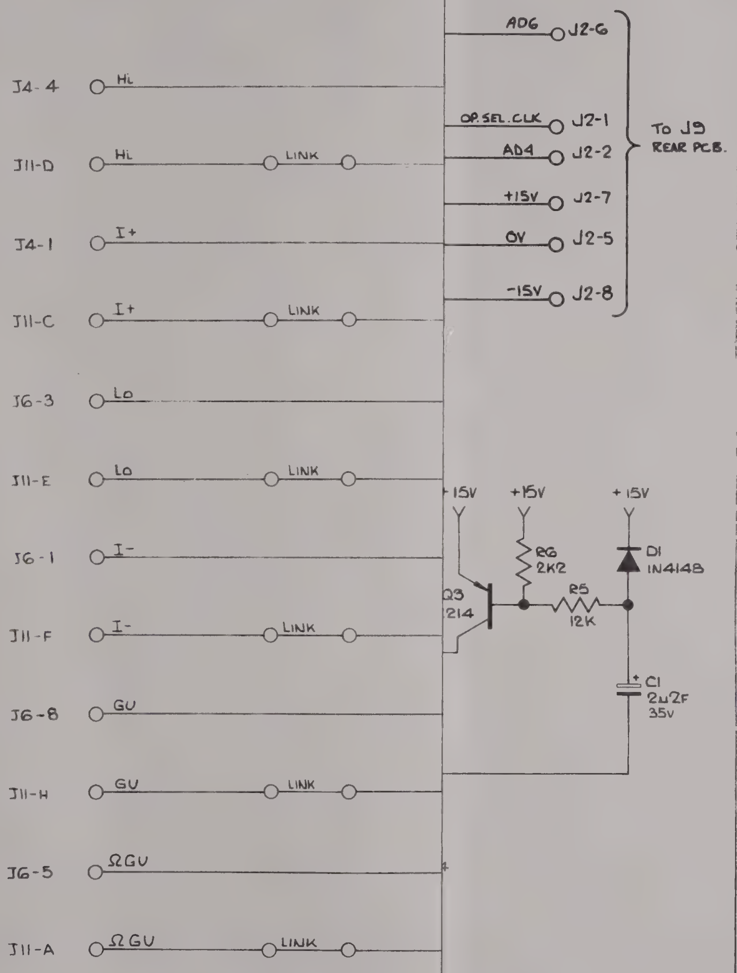
DRAWING No.
430386

FIRST USED ON
1061/1071

THIRD ANG
DRAWN IN ACCORDANCE

NOTES

ISS.	CHANGES
A	
1	RELEASED TO PRODUCTION 17 MAY 79 W.G.S.
2	ECO 981. BJ. M1 ADDED R11 " R12 " D5 DELETED. 6-11-79
3	ECO 1034. BJ. R12 WAS JOINED BETWEEN J2-6 & M1-14. 2-1-80.
4	ECO.1085 B5 - BETWEEN J4-1 & J5-1 REMOVED. PINS OF J4 & J5 RE-NUMBERED FOR 4WAY CONNECTORS. IL 22.4.80
5	ECO. 1167. 1154, R1 WAS 18K. R10. R14. R16. R18. R20. C4. C5. C6. D5. D6. D7 & Q6 ADDED. IL 23.9.80
6	ECO 1199 R 10 WAS 12 K JR 24.2.81


AD6 J2-6
J4-4 HI
OP.SEL.CLK J2-1
J11-D HI LINK
AD4 J2-2
To J9 REAR PCB.
+15V J2-7
J4-1 I+
0V J2-5
-15V J2-8
J11-C I+ LINK
J6-3 LO
J11-E LO LINK
+15V
+15V
+15V
J6-1 I-
R6 2K2
D1 1N4148
Q3 214
R5 12K
J11-F I- LINK
C1 2u2F 35V
J6-8 GU
J11-H GU LINK
J6-5 ΩGU
J11-A ΩGU LINK

NOTES.

1. J4 & J6 ARE FROM FRONT PANEL TERMINALS
2. J11 IS THE REAR INPUT SOCKET ON RE PANEL

DRAWN W.G.SMITH	CHECKED	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES DECIMAL TO 2 PLACES FRACTIONAL METRIC DIMENSIONS DECIMAL TO 2 PLACES DECIMAL TO 1 PLACE WHOLE DIMENSIONS UNLESS OTHERWISE STAT	RWICH.
TRACED	APPROVED	SCALE NOT TO BE SCALED		
DATE 17 MAY 79	DATE 17 MAY 79			

DRAWING SIZE
A2

DRAWING No.
430386

SHEET
1 OF 1.

DRAWING No.	400386
FIRST USED ON	1061/71

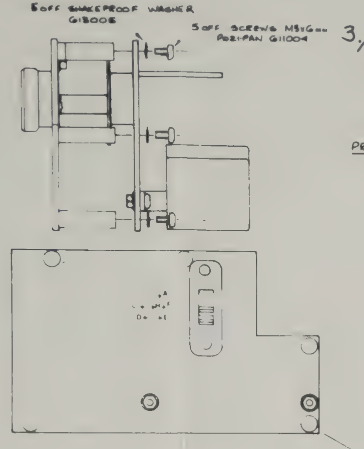
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

ISS	CHANGES
A	
1	[illegible] 17 MAY 79 [illegible]
2	SEE SHEET 1. BJ [illegible]
3	SEE SHEET 1 [illegible]
4	SEE SHEET 1. 9-1-[illegible]
5	ECO 1085 J5 WAS 8 WAY [illegible] [illegible] 22.4.80
6	SEE SHEET 1 [illegible]
7	SEE SHEET 1 [illegible]


5 OFF SHAKEPROOF WASHER G13006
5 OFF SCREWS M3×6mm POZI-PAN G11004

3./ BOTTOM VIEW SHOWS THE HOLES IN THE P.C.B (INDICATED BY CROSSES). THESE HOLES ARE FOR THE WIRES FROM THE 7 PIN SOCKET
IT IS A SUGGESTION THAT THE WIRES ARE STAGGERED TO MAKE ASSY EASIER (AS WIRING THE RELAYS).

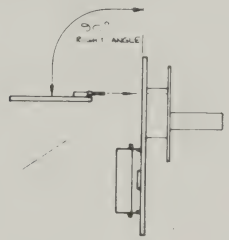
PROCEDURE

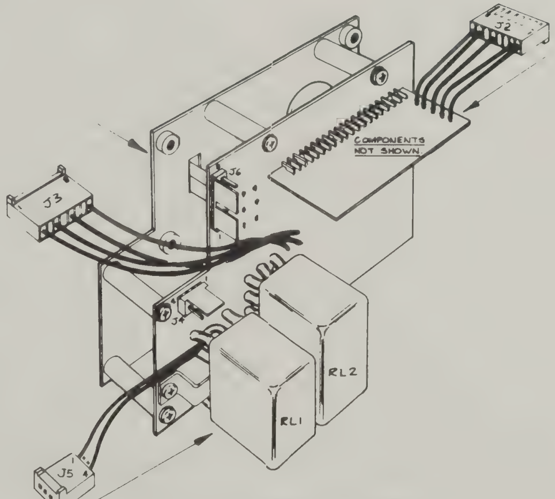
① THE WIRES SHOULD LINE UP WITH THE APPROPRIATE HOLES. IE. WIRE FROM PIN A OF SOCKET SHOULD BE INSERTED INTO HOLE A', WIRE FROM PIN C TO HOLE C' AND SO ON.

② WHEN THE WIRES ARE INSERTED IN THE APPROPRIATE HOLES. SECURE THE 2 ASSY'S TOGETHER WITH THE M3×6mm POZI PAN SCREWS & SHAKEPROOF WASHERS, SCREWED IN THE 5 STANDOFFS (AS DETAILED)

③ LIGHTLY PULL ON THE TIN COPPER WIRES SO THE WIRE IS TAUT, THEN SOLDER & CROP IN THE USUAL MANNER.

2./ INSERT CONNECTORS AS SHOWN
SOLDER ALL 20 AMP PINS & CROP LEGS IN USUAL MANNER
THE BOARD IS TO BE AT 90° WHEN SOLDERED IN.





FINISHED ASSEMBLY.

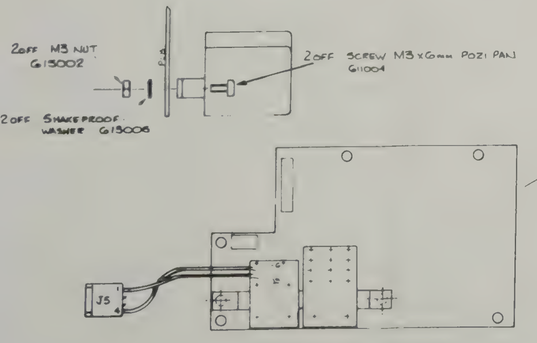
1./ SKETCH BELOW SHOWS THE 2 RELAY & BRACKET ASSEMBLY (FROM SHEET 1). THE CROSSES INDICATE HOLES IN THE PCB INTO WHICH THE WIRES FROM THE RELAYS ARE INSERTED

PROCEDURE

① INSERT THE WIRES INTO THE APPROPRIATE HOLES IN THE PCB (WIRES CUT AT DIFFERENT LENGTHS TO AID ASSEMBLY).

② WHEN THE WIRES ARE ALL IN PLACE SECURE THE BRACKET TO THE PCB USING THE SCREWS, WASHERS & NUTS SHOWN BELOW.

③ SOLDER & CROP WIRES IN THE USUAL MANNER. INSERT THE CRIMP PINS INTO SOCKET J5 PIN 6 OF RELAY TO PIN 4 OF J5 & PIN 9 TO PIN 1 AS SHOWN BELOW


2 OFF M3 NUT G15002
2 OFF SCREW M3×6mm POZI PAN G11004
2 OFF SHAKEPROOF WASHER G13006
J5

DRAWN W G SMITH	CHECKED [illegible]	DIMENSIONS IN MILLIMETRES	TOLERANCES INCH DIMENSIONS DECIMAL TO 3 PLACES, DECIMAL TO 2 PLACES, FRACTIONAL; METRIC DIMENSIONS DECIMAL TO 2 PLACES, DECIMAL TO 1 PLACE, WHOLE DIMENSIONS UNLESS OTHERWISE STATED; ANGULAR ±	MATERIAL —
TRACED	APPROVED	SCALE		FINISH —
DATE 10 MAY 79.	DATE 17 MAY 79.	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

TITLE: REAR INPUT ASSY

DRAWING No. 400386

2 of 8

DRAWING No
430386
FIRST USED ON
1061/1071

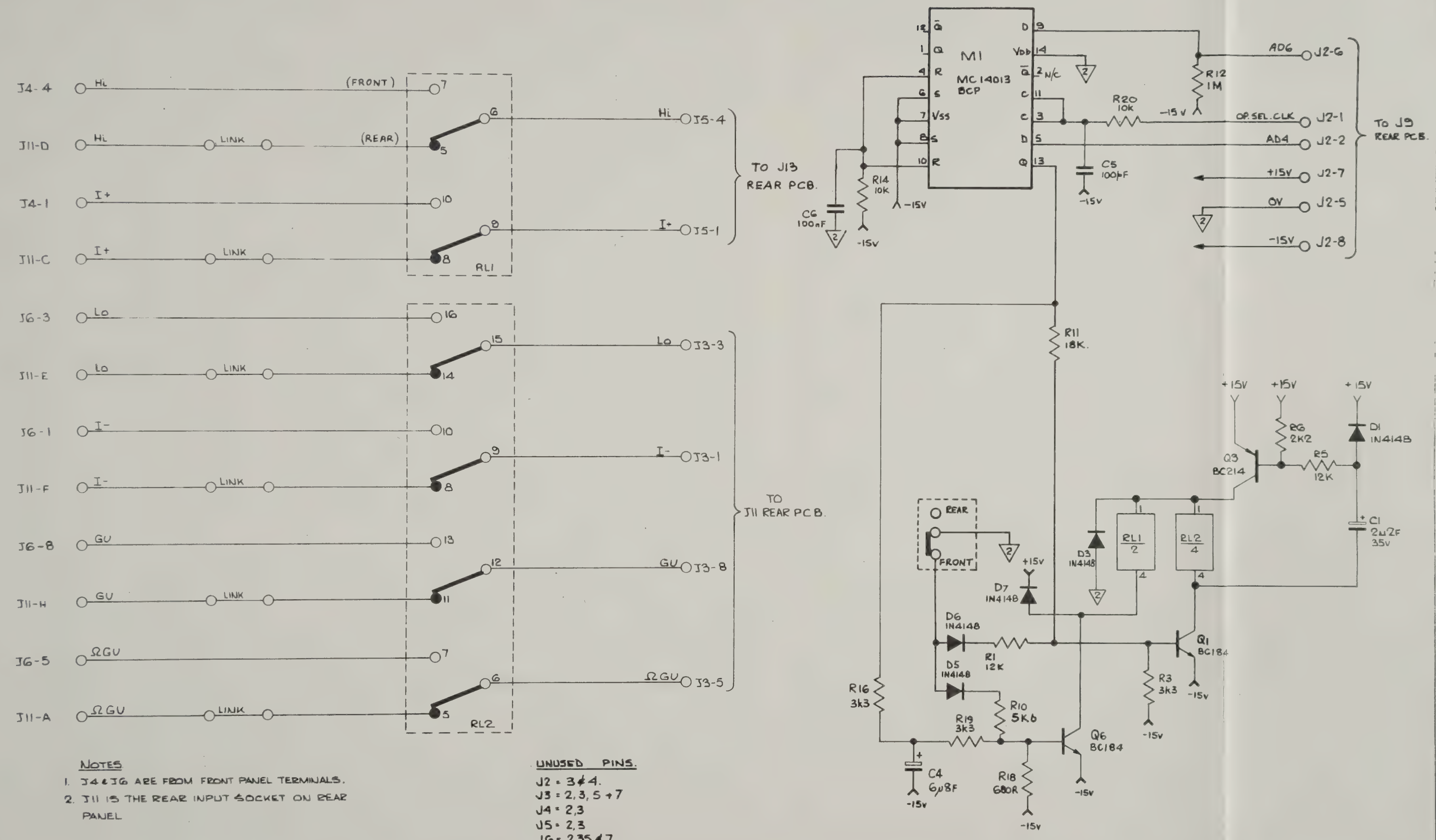
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

BE REMOVED

NOTES

ISS.	CHANGES
A	
1	RELEASED TO PRODUCTION 17 MAY 79 W G S
2	ECO 981. BJ M1 ADDED R11 " R12 " D5 DELETED. 6-11-79
3	ECO 1034. BJ R12 WAS JOINED BETWEEN J2-6 & M1-14. 2-1-80.
4	ECO 1085 BS – BETWEEN J4-1 & J5-1 REMOVED. PINS OF J4 & J5 RE-NUMBERED FOR 4WAY CONNECTORS. IL 22.4.80
5	ECO. 1167. 1154, R1 WAS 18K. R10. R14. R16. R18. R20. C4. C5. C6. D5. D6. D7 & Q6 ADDED. IL 23.9.80
6	ECO 1199 R10 WAS 12 K JR 24.2.81



J4-4
Hi
(FRONT)
J11-D
LINK
(REAR)
J4-1
I+
J11-C
RL1
J6-3
Lo
J11-E
J6-1
I-
J11-F
J6-8
GU
J11-H
J6-5
ΩGU
J11-A
RL2
J5-4
J5-1
TO J13 REAR PCB.
J3-3
J3-1
J3-8
J3-5
TO J11 REAR PCB.
M1
MC 14013 BCP
Q̄
Q
R
S
Vss
D
VDD
N/C
C
C6 100nF
R14 10K
-15V
C5 100pF
R20 10K
R12 1M
AD6
OP.SEL.CLK
AD4
+15V
0V
-15V
J2-6
J2-1
J2-2
J2-7
J2-5
J2-8
TO J9 REAR PCB.
R11 18K.
+15V
Q3 BC214
R6 2K2
R5 12K
D1 1N4148
C1 2u2F 35v
REAR
FRONT
D3 1N4148
RL1 2
RL2 4
D7 1N4148
D6 1N4148
D5 1N4148
R1 12K
Q1 BC184
R3 3k3
R16 3k3
R19 3k3
R10 5K6
Q6 BC184
C4 6μ8F
R18 680R

NOTES

1. J4 & J6 ARE FROM FRONT PANEL TERMINALS.
2. J11 IS THE REAR INPUT SOCKET ON REAR PANEL

UNUSED PINS.

J2 = 3 & 4.
J3 = 2, 3, 5 + 7
J4 = 2,3
J5 = 2,3
J6 = 2,3,5 & 7

DRAWN	CHECKED	DIMENSIONS IN	TOLERANCES ANGULAR ± ½°	MATERIAL
W.G. SMITH		MILLIMETRES	INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64	———
TRACED	APPROVED	SCALE	METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	FINISH
DATE [illegible] MAY 79	DATE 17 MAY 79	NOT TO BE SCALED		———

datron ELECTRONICS LTD. NORWICH.

DRAWING SIZE
A2

TITLE
REAR INPUT CIRCUIT DIAGRAM.

DRAWING No.
430386

SHEET
1 OF 1.

DRAWING No.
400402

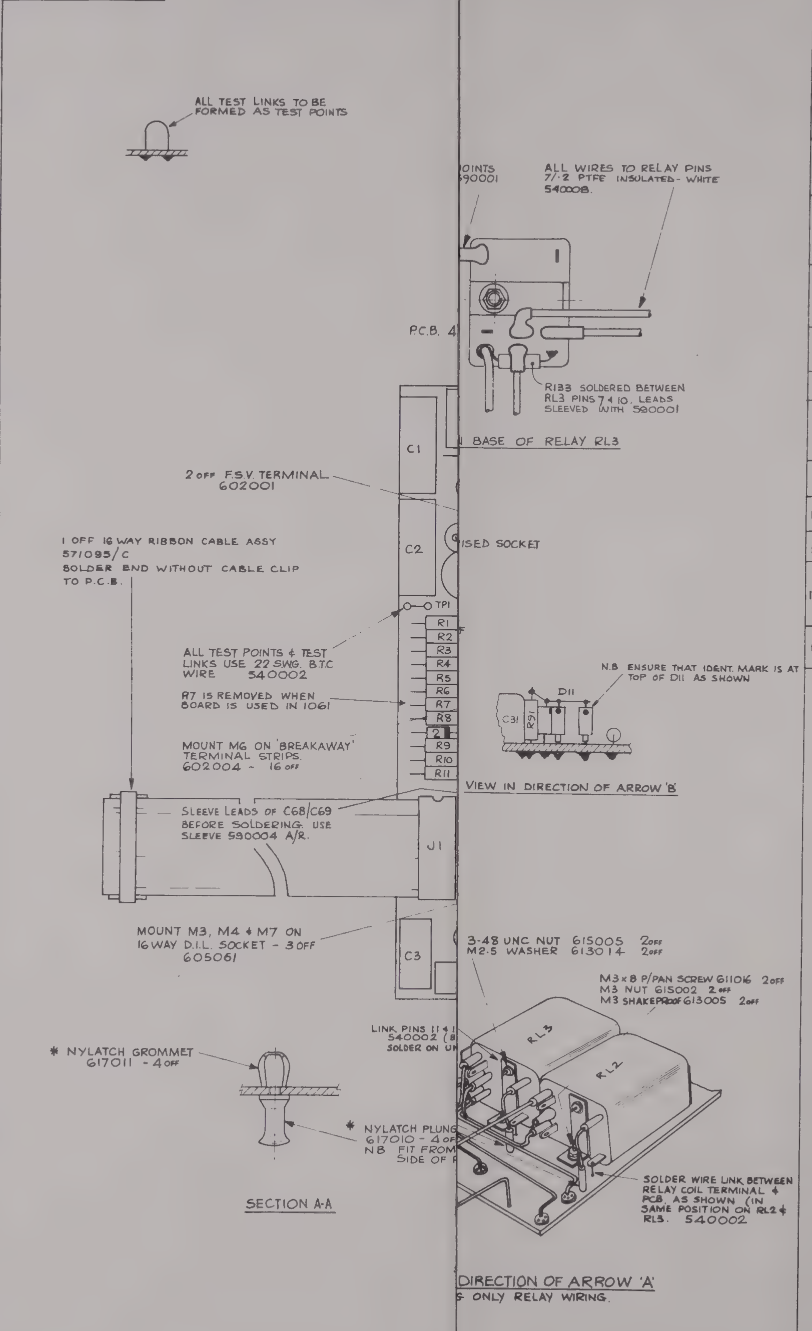
FIRST USED ON 1061/1071

THIRD ANGL

DRAWN IN ACCORDANCE W

NOTES

1. DO NOT FIT R7 FOR 1061 MODELS.



ALL TEST LINKS TO BE FORMED AS TEST POINTS
OINTS
590001
ALL WIRES TO RELAY PINS 7/·2 PTFE INSULATED - WHITE 540008.
P.C.B. 4
R133 SOLDERED BETWEEN RL3 PINS 7 & 10. LEADS SLEEVED WITH 590001
N BASE OF RELAY RL3
C1
2 OFF F.S.V. TERMINAL 602001
C2
ISED SOCKET
1 OFF 16 WAY RIBBON CABLE ASSY 571095/C SOLDER END WITHOUT CABLE CLIP TO P.C.B.
TP1
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
ALL TEST POINTS & TEST LINKS USE 22 SWG. B.T.C WIRE 540002
R7 IS REMOVED WHEN BOARD IS USED IN 1061
MOUNT M6 ON 'BREAKAWAY' TERMINAL STRIPS. 602004 - 16 OFF
N.B ENSURE THAT IDENT. MARK IS AT TOP OF D11 AS SHOWN
D11
C31
R91
VIEW IN DIRECTION OF ARROW 'B'
SLEEVE LEADS OF C68/C69 BEFORE SOLDERING. USE SLEEVE 590004 A/R.
J1
MOUNT M3, M4 & M7 ON 16 WAY D.I.L. SOCKET - 3 OFF 605061
C3
3-48 UNC NUT 615005 2OFF
M2.5 WASHER 613014 2OFF
M3×8 P/PAN SCREW 611016 2OFF
M3 NUT 615002 2OFF
M3 SHAKEPROOF 613005 2OFF
LINK PINS 11 & 1
540002 (8
SOLDER ON U
RL3
RL2
* NYLATCH GROMMET 617011 - 4 OFF
* NYLATCH PLUNG
617010 - 4 OF
NB FIT FROM
SIDE OF
SOLDER WIRE LINK BETWEEN RELAY COIL TERMINAL & PCB. AS SHOWN (IN SAME POSITION ON RL2 & RL3. 540002
SECTION A-A
DIRECTION OF ARROW 'A'
G ONLY RELAY WIRING.

ISS.	CHANGES	
1	RELEASED TO PRODN IL 17.9.79	
2	ECO. 956. + 957 PARTS LIST CHANGES IL 8.10.79	MD
3	ECO. 972, 979, 987, 993, 996 RL2 & RL3 WERE ITT. RELAY WIRE WAS P.V.C. R11 WAS 120K D13 WAS OA47 R127 100M. ADDED B.J. 25-10-79	MD
4	ECO. 998. 1007 PARTS LIST CHANGES R128, C65, C66 & D16 ADDED IL 31.10.79	MD
5.	ECO 1010 WIRE TERM ASSYS WERE 400379/2 & 400379/5. GU SHIELD SKETCH ADDED. B.J. 5-11-79.	MD
6	ECO.1011.1016.1000 1036 C65 & D10 REMOVED D10 REPLACED BY C67 FITTED IN PARALLEL WITH R129 VALUE CHANGES TO PL. IL 2.1.80	MD
7	ECO. 1058 C68, C69 ADDED. SCREWS TO SECURE GUARD SHIELD WERE 3 OFF 611015 IL 24.1.80	MD
8	ECO 1069 R70 & R71 WERE 680e 000681 C70 33pf 102330 ADDED W.G.S 13 FEB 80	MD
9	ECO 1082 PARTS LIST CHANGES IL 27.2.80	MD
10	ECO. 1112. 1099. 1113 C71 R130 ADDED J2-4 WAS 605057 PTS LT. CHANGE TO RSO IL 14.4.80	MD
11	ECO. 1133 D17 ADDED. IL 13.6.80	MD
12	ECO 1160 C72 & R135 ADDED IL 24.9.80	MD
13	ECO 1190 PARTS LIST CHANGES IL 5.1.81	MD
14	ECO.1201 1207 C34 & C72 DELETED. R136 ADDED OTHER PARTS LIST CHANGES. IL 8.4.81	MD
15	ECO 1217 J1 WAS 16 WAY SOCKET. JR 19 · 8 · 81	MD

CS LTD. NORWICH.

PTION 10) 1061/1071

DRAWING SIZE
A1

DRAWING No.
400402

SHEET
1 OF 17

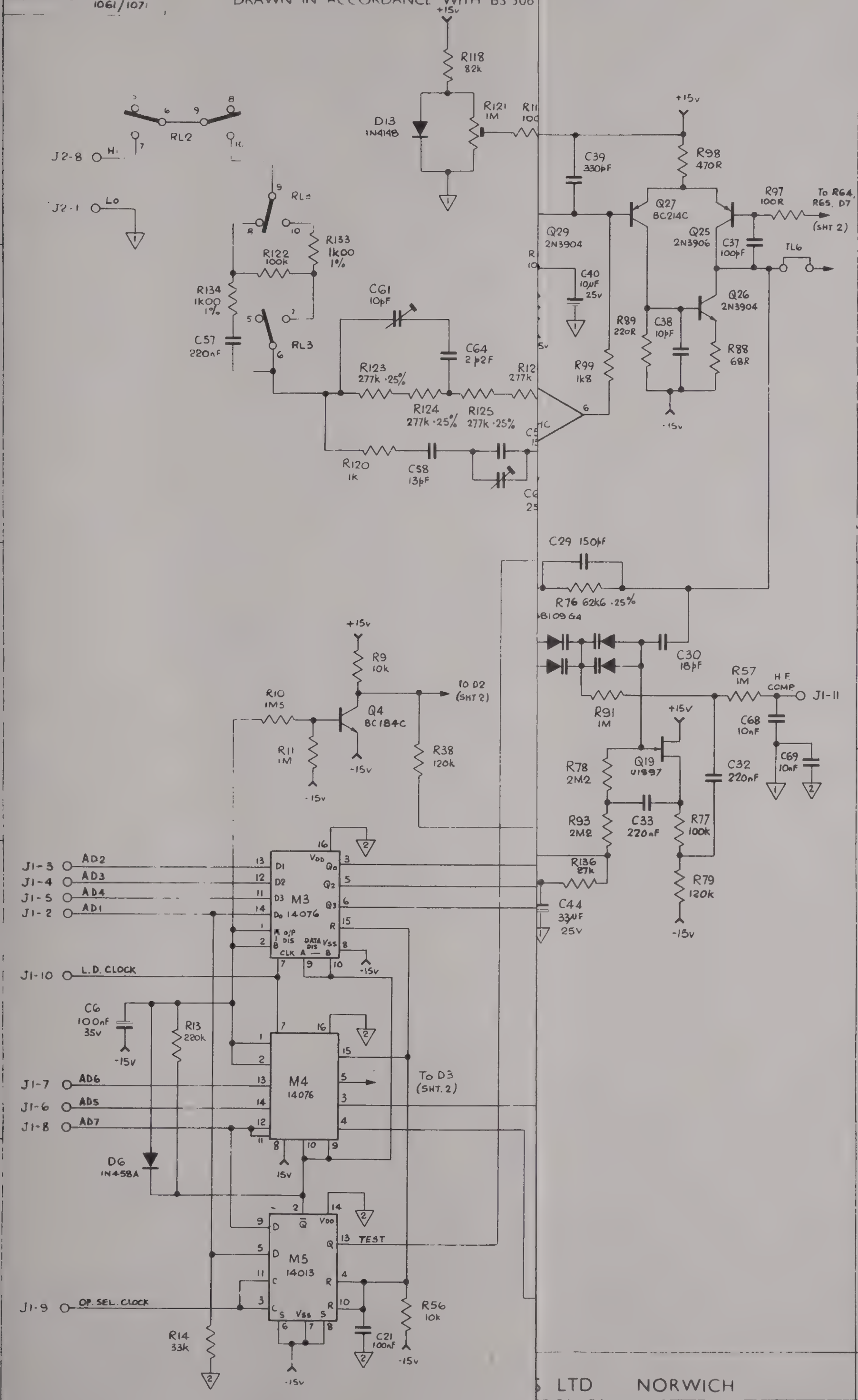
I W 116

1 2

DRAWING No
430402
FIRST USED ON 1061/1071

THIRD ANGLE PR
DRAWN IN ACCORDANCE WITH BS 308

NOTES


+15v
R118
82k
D13
1N4148
R121
1M
R11
100
RL2
J2-8
HI
J2-1
LO
RL3
R133
1k00
1%
R122
100k
R134
1k00
1%
C57
220nF
C61
10pF
C64
2p2F
R123
277k ·25%
R124
277k ·25%
R125
277k ·25%
R12
277k
R120
1k
C58
13pF
C39
330pF
+15v
R98
470R
Q27
BC214C
Q29
2N3904
Q25
2N3906
R97
100R
To R64, R65, D7
(SHT 2)
C37
100pF
TL6
C40
10μF
25v
Q26
2N3904
R89
220R
C38
10pF
R88
68R
R99
1k8
-15v
C29 150pF
R76 62k6 ·25%
BB109 G4
C30
18pF
R57
1M
HF COMP
J1-11
R91
1M
+15v
C68
10nF
C69
10nF
Q19
U1897
C32
220nF
R78
2M2
C33
220nF
R93
2M2
R77
100k
R136
87k
R79
120k
C44
33μF
25V
-15v
+15v
R9
10k
TO D2
(SHT 2)
R10
1M5
Q4
BC184C
R11
1M
-15v
R38
120k
-15v
J1-3 AD2
J1-4 AD3
J1-5 AD4
J1-2 AD1
M3
14076
VDD
D1
D2
D3
D0
Q0
Q2
Q3
R
O/P DIS
DATA DIS
VSS
CLK A — B
J1-10 L.D. CLOCK
C6
100nF
35v
-15v
R13
220k
M4
14076
To D3
(SHT. 2)
J1-7 AD6
J1-6 AD5
J1-8 AD7
D6
1N458A
15v
M5
14013
Q̄
VDD
D
Q
C
R
S
VSS
13 TEST
J1-9 OP. SEL. CLOCK
R14
33k
R56
10k
C21
100nF
-15v

ISS.	CHANGES	
1	RELEASED TO PRODN IL 17.9.79	
2	ECO. 956. 957 R10 WAS 220k R11 WAS 18k R13 WAS 33k C6 WAS 680nF SEE ALSO SHEET 2 IL 8.10.79	ND
3	ECO. 993 996 R11 WAS 120K R127 100M ADDED D13 WAS OA47 B.J. 24-10-79	ND
4	ECO.999 1007 R117 WAS 100R M4/11 + 12 LINKED C44 WAS 1μF C56 WAS 10μF C34 WAS 10μF C46 WAS 2p2F C65 + C66 ADDED R81 WAS 100R R82 WAS 1K R128 ADDED SEE ALSO SHT. 2 IL 1. 11. 79	ND
5	ECO.1011. 1016. 1036 C45 WAS 3p3F C46 WAS 10pF C34 WAS 22μF TANT C65 REMOVED C66 WAS 220pF R128 WAS 15M R81. R82 WERE 330R C56 WAS 100μF D10 REMOVED C67. R129 ADDED R104 WAS 10k R105 WAS 68k C64 WAS 3p3F IL 2.1.80	ND
6	ECO.1058 C68 + C69 ADDED IL 23.1.80	ND
7	ECO 1069 SEE SHEET 2 IL 15.2.80	ND
8	SEE SHEET 2	ND
9	ECO 1112. 1113 C71, R130, R133, R134 ADDD. SEE ALSO SHEET 2 IL 14.4.80	MD
10	ECO.1133 D17 ADDED IL 13.6.80.	ND
11	ECO 1160 R135 + C72 ADDED	M
12	ECO 1190 D11 WAS MUAM-2 C30 WAS 13pF IL 5.1.80	ND
13	ECO.1201. 1207 C34 + C72 DELETED R136 ADDED C39 WAS 100pF C44 WAS 10μF C45 WAS 10pF C46 WAS 8p2F R79 WAS 110k Q28 WAS 2N3904 IL 8.4.81	MD

DRAWING SIZE
A1

S LTD NORWICH

AMP

DRAWING No
430402

SHEET
1 OF 2

DRAWING No 400402
FIRST USED ON 1061/1071

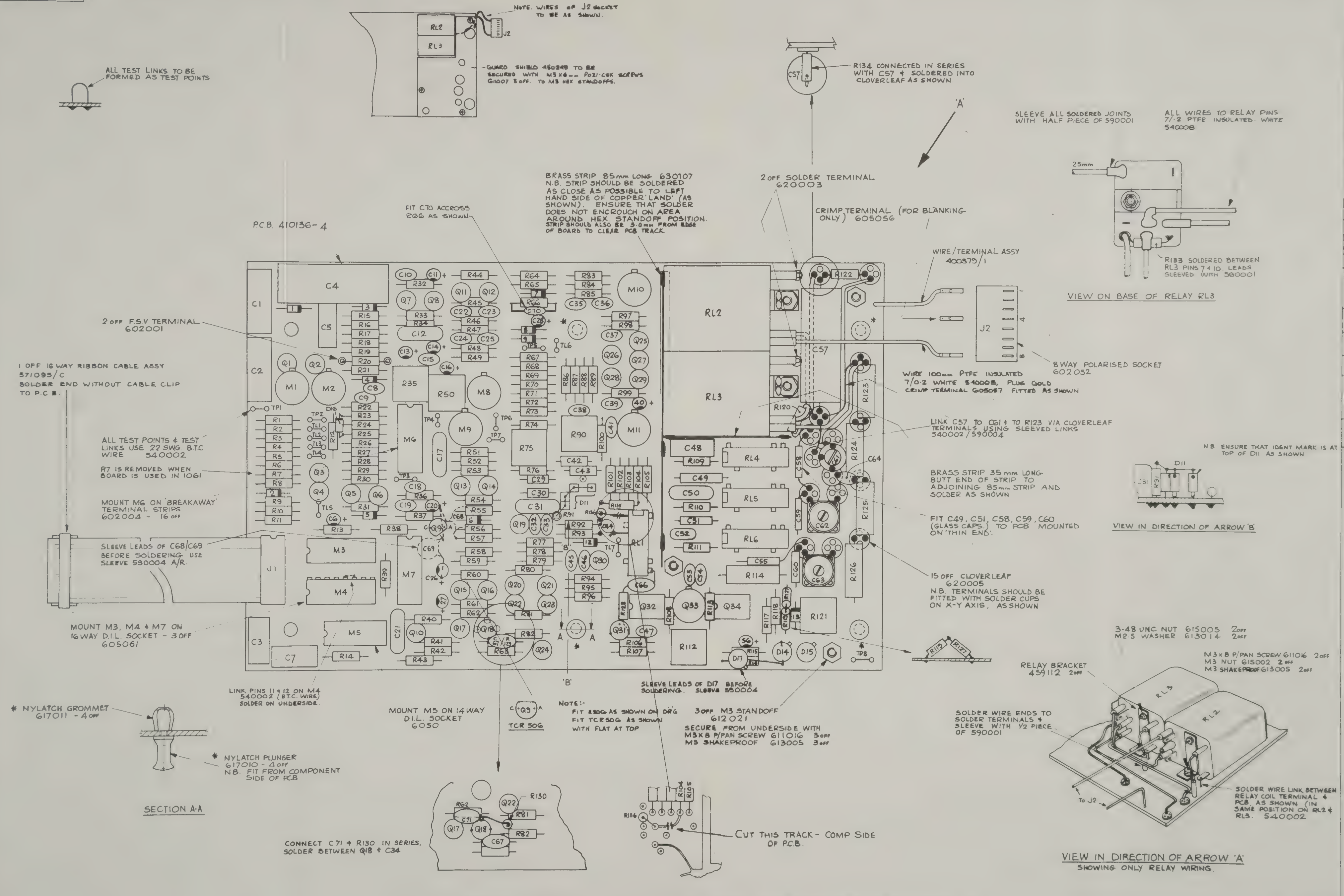
THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1. DO NOT FIT R7 FOR 1061 MODELS.



ALL TEST LINKS TO BE FORMED AS TEST POINTS

NOTE. WIRES OF J2 SOCKET TO BE AS SHOWN.

GUARD SHIELD 450249 TO BE SECURED WITH M3 X 6mm POZI-CSK SCREWS G11007 3 OFF. TO M3 HEX STANDOFFS.

R134 CONNECTED IN SERIES WITH C57 ♦ SOLDERED INTO CLOVERLEAF AS SHOWN.

SLEEVE ALL SOLDERED JOINTS WITH HALF PIECE OF 590001

ALL WIRES TO RELAY PINS 7/·2 PTFE INSULATED - WHITE 540008

R133 SOLDERED BETWEEN RL3 PINS 7 ♦ 10. LEADS SLEEVED WITH 590001

VIEW ON BASE OF RELAY RL3

BRASS STRIP 85mm LONG 630107
N.B. STRIP SHOULD BE SOLDERED AS CLOSE AS POSSIBLE TO LEFT HAND SIDE OF COPPER 'LAND'. (AS SHOWN). ENSURE THAT SOLDER DOES NOT ENCROUCH ON AREA AROUND HEX. STANDOFF POSITION. STRIP SHOULD ALSO BE 3.0mm FROM EDGE OF BOARD TO CLEAR PCB TRACK.

2 OFF SOLDER TERMINAL 620003

CRIMP TERMINAL (FOR BLANKING ONLY) 605056

FIT C70 ACCROSS R66 AS SHOWN

WIRE/TERMINAL ASSY 400379/1

8 WAY POLARISED SOCKET 602052

WIRE 100mm PTFE INSULATED 7/0.2 WHITE 540008, PLUG GOLD CRIMP TERMINAL 605057. FITTED AS SHOWN

LINK C57 TO C61 ♦ TO R123 VIA CLOVERLEAF TERMINALS USING SLEEVED LINKS 540002 / 590004

N B ENSURE THAT IDENT MARK IS AT TOP OF D11 AS SHOWN

BRASS STRIP 35 mm LONG BUTT END OF STRIP TO ADJOINING 85mm STRIP AND SOLDER AS SHOWN

FIT C49, C51, C58, C59, C60 (GLASS CAPS.) TO PCB MOUNTED ON 'THIN END'.

VIEW IN DIRECTION OF ARROW 'B'

15 OFF CLOVERLEAF 620005
N.B. TERMINALS SHOULD BE FITTED WITH SOLDER CUPS ON X-Y AXIS, AS SHOWN

2 OFF F.S.V TERMINAL 602001

1 OFF 16 WAY RIBBON CABLE ASSY 571095/C
SOLDER END WITHOUT CABLE CLIP TO P.C.B.

ALL TEST POINTS ♦ TEST LINKS USE 22 SWG. B.T.C WIRE 540002

R7 IS REMOVED WHEN BOARD IS USED IN 1061

MOUNT M6 ON 'BREAKAWAY' TERMINAL STRIPS 602004 - 16 OFF

SLEEVE LEADS OF C68/C69 BEFORE SOLDERING. USE SLEEVE 590004 A/R.

MOUNT M3, M4 ♦ M7 ON 16 WAY D.I.L. SOCKET - 3 OFF 605061

LINK PINS 11 ♦ 12 ON M4 540002 (B.T.C. WIRE) SOLDER ON UNDERSIDE.

MOUNT M5 ON 14 WAY D.I.L. SOCKET 6050

TCR 506

NOTE:-
FIT 8506 AS SHOWN ON DR'G
FIT TCR506 AS SHOWN WITH FLAT AT TOP

SLEEVE LEADS OF D17 BEFORE SOLDERING. SLEEVE 590004

3 OFF M3 STANDOFF 612021
SECURE FROM UNDERSIDE WITH
M3X8 P/PAN SCREW 611016 3 OFF
M3 SHAKEPROOF 613005 3 OFF

3-48 UNC NUT 615005 2 OFF
M2.5 WASHER 613014 2 OFF

M3 x 8 P/PAN SCREW 611016 2 OFF
M3 NUT 615002 2 OFF
M3 SHAKEPROOF 613005 2 OFF

RELAY BRACKET 459112 2 OFF

SOLDER WIRE ENDS TO SOLDER TERMINALS ♦ SLEEVE WITH ½ PIECE OF 590001

SOLDER WIRE LINK BETWEEN RELAY COIL TERMINAL ♦ PCB AS SHOWN (IN SAME POSITION ON RL2 ♦ RL3. 540002

* NYLATCH GROMMET 617011 - 4 OFF

* NYLATCH PLUNGER 617010 - 4 OFF
NB. FIT FROM COMPONENT SIDE OF PCB

SECTION A-A

CONNECT C71 ♦ R130 IN SERIES, SOLDER BETWEEN Q18 ♦ C34.

CUT THIS TRACK - COMP SIDE OF P.C.B.

VIEW IN DIRECTION OF ARROW 'A'
SHOWING ONLY RELAY WIRING.

ISS.	CHANGES	
1	RELEASED TO PROD IL 17.9.79	
2	ECO 956 ♦ 957 PARTS LIST CHANGES IL 8 10 79	MD
3	ECO. 972, 979, 987, 993, 956 RL2 & RL3 WERE ITT RELAY WIRE WAS P.V.C. R11 WAS 120K D18 WAS OA47 R127 100M ADDED BJ 25-10-79	MD
4	ECO 999 1007 PARTS LIST CHANGES R128, C65, C66 ♦ D16 ADDED IL 31 10 79	MD
5	ECO 1010 WIRE TERM ASSY'S WERE 400379/2 & 400379/5 GU SHIELD SKETCH ADDED BJ 5-11-79	MD
6	ECO 1011 1016 1000 1036 C65 ♦ D10 REMOVED D10 REPLACED BY C67 FITTED IN PARALLEL WITH R129 VALUE CHANGES TO PL IL 2.1.80	MD
7	ECO 1059 C68, C69 ADDED SCREWS TO SECURE GUARD SHIELD WERE 3 OFF 611015 IL 24 1 80	MD
8	ECO 1089 R70 R71 WERE 680K 0006L C70 33pF 102330 ADDED WGS 13 FEB 80	MD
9	ECO 1082 PARTS LIST CHANGES IL 27 2 80	MD
10	ECO 1112 1099. 1113 C71 R130 ADDED J2-4 WAS 605057 PTS LT. CHANGE TO R50 IL 14.4.80	MD
11	ECO. 1133 D17 ADDED IL 13.6 80	MD
12	ECO 1160 C72 ♦ R133 ADDED IL 24 9 80	MD
13	ECO 1190 PARTS LIST CHANGES IL 5 1 81	MD
14	ECO 1201 1207 C34 ♦ C72 DELETED, R136 ADDED OTHER PARTS LIST CHANGES IL 8.4 81	MD
15	ECO 1217 J1 WAS 16 WAY SOCKET JR 19 6 81	MD

DRAWN IL	CHECKED RLW	DIMENSIONS IN MILLIMETRES	TOLERANCES ANGULAR ± ½° INCH DIMENSIONS DECIMAL TO 3 PLACES ± 005 DECIMAL TO 2 PLACES ± 010 FRACTIONAL ± 1/64 METRIC DIMENSIONS DECIMAL TO 2 PLACES ± 1mm DECIMAL TO 1 PLACE ± 2mm WHOLE DIMENSIONS ± 4mm UNLESS OTHERWISE STATED	MATERIAL AS PARTS LIST
TRACED	APPROVED	SCALE 2:1		FINISH ——
DATE 22.8.79	DATE 3.9.79	NOT TO BE SCALED		

datron ELECTRONICS LTD. NORWICH.

TITLE A.C. PCB. ASSY (OPTION 10) 1061/1071

DRAWING SIZE A1

DRAWING No 400402

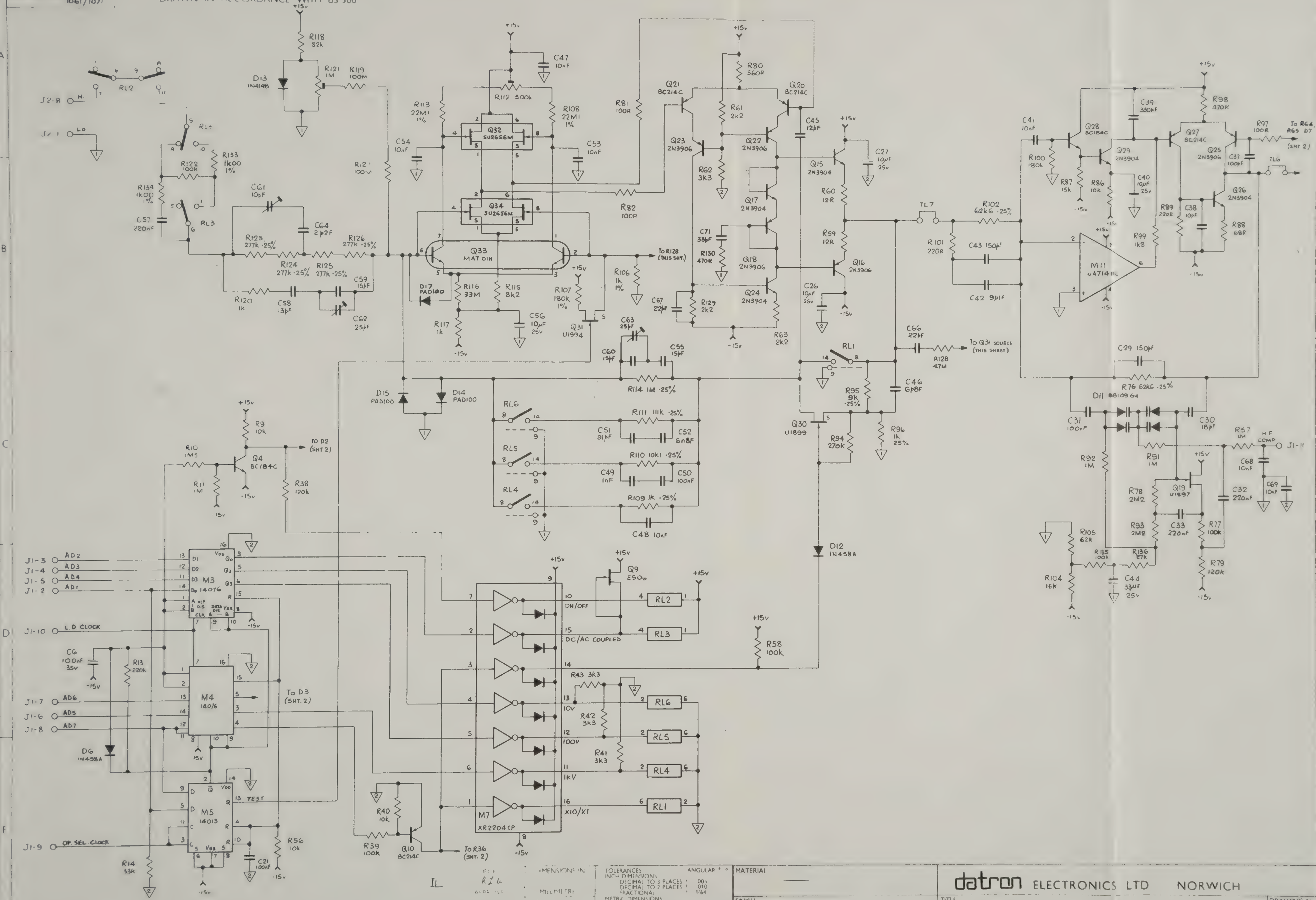
SHEET 1 OF 17

DRAWING No 430402
FIRST USED ON 1061/1071

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

NOTES


1
2
3
4
5
7
A
B
C
D
E
+15v
R118 82k
R121 1M
R119 100M
D13 1N4148
RL2
J2-8 HI
J2 1 LO
RL1
R122 100k
R133 1k00 1%
R134 1k00 1%
C57 220nF
RL3
C61 10pF
C64 2p2F
R123 277k ·25%
R124 277k ·25%
R125 277k ·25%
R126 277k ·25%
R120 1k
C58 13pF
C59 15pF
C62 25pF
R113 22M1 1%
C54 10nF
R112 500k
C47 10nF
Q32 SU2656M
Q34 SU2656M
Q33 MAT 01H
R108 22M1 1%
C53 10nF
R127 100M
D17 PAD100
R116 33M
R115 8k2
R117 1k
-15v
C56 10µF 25v
R107 180k 1%
Q31 U1994
R106 1k 1%
To R128 (THIS SHT.)
R81 100R
R82 100R
Q21 BC214C
Q20 BC214C
R80 560R
R61 2k2
Q23 2N3906
Q22 2N3906
R62 3k3
Q17 2N3904
Q18 2N3906
C71 33pF
R130 470R
C67 22pF
R129 2k2
Q24 2N3904
R63 2k2
C45 12pF
Q15 2N3904
C27 10µF 25v
R60 12R
R59 12R
Q16 2N3906
C26 10µF 25v
C63 25pF
C60 15pF
C55 15pF
R114 1M ·25%
D15 PAD100
D14 PAD100
RL6
RL5
RL4
R111 111k ·25%
C51 91pF
C52 6n8F
R110 10k1 ·25%
C49 1nF
C50 100nF
R109 1k ·25%
C48 10nF
TL7
R102 62k6 ·25%
R101 220R
C43 150pF
C42 9p1F
C66 22pF
R128 47M
To Q31 SOURCE (THIS SHEET)
C46 6p8F
R95 9k ·25%
R96 1k 25%
Q30 U1899
R94 270k
D12 1N458A
R58 100k
C41 10nF
R100 180k
Q28 BC184C
Q29 2N3904
C39 330pF
R87 15k
R86 10k
C40 10µF 25v
M11 µA714HC
R99 1k8
R89 220R
C38 10pF
Q27 BC214C
Q25 2N3906
R98 470R
R97 100R
To R64, R65 D7 (SHT 2)
C37 100pF
TL6
Q26 2N3904
R88 68R
C29 150pF
R76 62k6 ·25%
D11 BB109G4
C31 100nF
C30 18pF
R57 1M
H F COMP
J1-11
C68 10nF
C69 10nF
R92 1M
R91 1M
Q19 U1897
R78 2M2
R93 2M2
C33 220nF
R77 100k
C32 220nF
R105 62k
R135 100k
R136 27k
C44 33µF 25v
R104 16k
R79 120k
R9 10k
R10 1M5
Q4 BC184C
To D2 (SHT 2)
R11 1M
R38 120k
J1-3 AD2
J1-4 AD3
J1-5 AD4
J1-2 AD1
M3 14076
J1-10 L.D. CLOCK
C6 100nF 35v
R13 220k
M4 14076
To D3 (SHT. 2)
J1-7 AD6
J1-6 AD5
J1-8 AD7
D6 1N458A
M5 14013
TEST
J1-9 OP. SEL. CLOCK
R14 33k
C21 100nF
R56 10k
Q9 E506
M7 XR2204CP
ON/OFF
DC/AC COUPLED
10v
100v
1kV
X10/X1
R43 3k3
R42 3k3
R41 3k3
R40 10k
R39 100k
Q10 BC214C
To R36 (SHT. 2)
RL2
RL3
RL6
RL5
RL4
RL1

ISS	CHANGES
1	RELEASED TO PROD IL 17.9.79
2	ECO 956 957 R10 WAS 220k R11 WAS 18k R13 WAS 33k C6 WAS 680nF SEE ALSO SHEET 2 IL 8 10 79
3	ECO 993 996 R11 WAS 120K R127 100M ADDED D13 WAS OA47 B.J. 24-10-79
4	ECO 999 1007 R117 WAS 100R M4/11 + 12 LINKED C44 WAS 1µF C56 WAS 10µF C34 WAS 10µF C46 WAS 2p2F C65 + C66 ADDED R81 WAS 100R R82 WAS 1k R128 ADDED SEE ALSO SHT. 2 IL 1. 11. 79
5	ECO. 1011 1016 1036 C45 WAS 3p3F C46 WAS 10pF C34 WAS 22µF TANT C65 REMOVED C66 WAS 220pF R128 WAS 15M R81. R82 WERE 330R C56 WAS 100µF D10 REMOVED C67. R129 ADDED R104 WAS 10k R105 WAS 68k C64 WAS 3p3F IL 2.1.80
6	ECO 1058 C68 + C69 ADDED IL 23.1.80
7	ECO 1069 SEE SHEET 2 IL 15 2 80
8	SEE SHEET 2
9	ECO 1112 1113 C71, R130, R133, R134 ADDD SEE ALSO SHEET 2 IL 14.4 80
10	ECO 1133 D17 ADDED IL 13.6.80.
11	ECO 1160 R135 + C72 ADDED
12	ECO 1190 D11 WAS MUAM-2 C30 WAS 13pF IL 5.1 80
13	ECO 1201 1207 C34 + C72 DELETED R136 ADDED C39 WAS 100pF C44 WAS 10µF C45 WAS 10pF C46 WAS 8p2F R79 WAS 110k Q28 WAS 2N3904 IL 8.4.81

IL
RJL
20.8.79
8 9 79
DIMENSIONS IN
MILLIMETRE
NOT TO BE SCALED

TOLERANCES
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± .005
DECIMAL TO 2 PLACES ± .010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED
ANGULAR ± °

MATERIAL —
FINISH —

datron ELECTRONICS LTD NORWICH

TITLE 1061/1071 AC - PREAMP

DRAWING SIZE A1
DRAWING No 430402
SHEET 1 OF 2

DRAWING N
430402
ISED ON

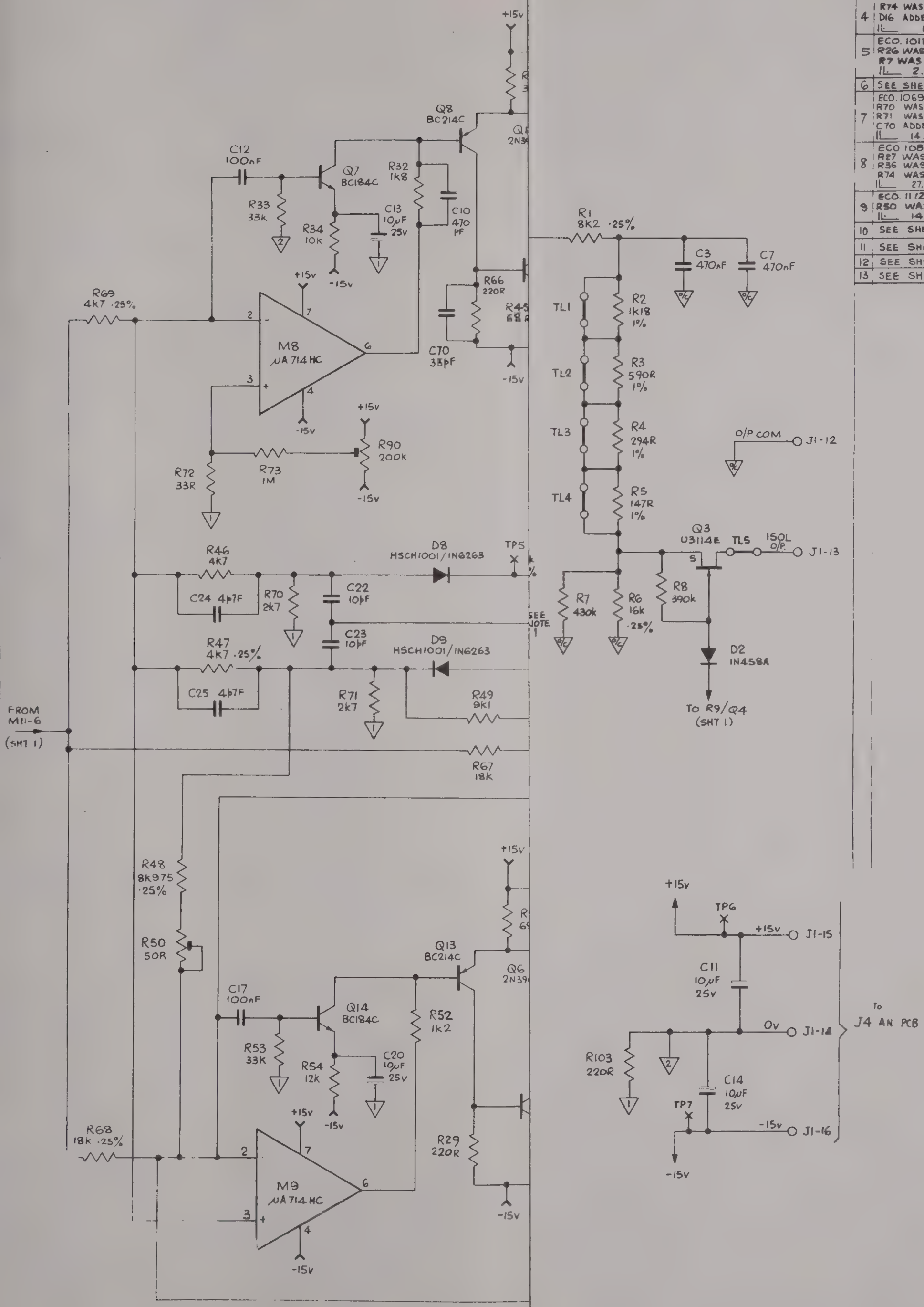
THIRD ANGLE PR

DRAWN IN ACCORDANCE WITH BS 30

NOTES

1 RESISTOR R7 IS NOT FITTED ON A.C. ASSEMBLIES USED IN 1061'S INSTRUMENTS

ISS.	CHANGES
1	RELEASED TO PRODN IL 17.9.79
2	ECO 956 C2 WAS 680nF IL 8.10.79
3	SEE SHT 1 24-10-79 B.J
4	R83 WAS 10k R74 WAS 1MS D16 ADDED IL 1.11.79
5	ECO. 1011. 1016. 1036 R26 WAS 180k R7 WAS 1M. IL 2.1.80
6	SEE SHEET 1
7	ECO. 1069 R70 WAS 680R R71 WAS 680R C70 ADDED IL 14.2 80
8	ECO 1082 R27 WAS 680k R36 WAS 820k R74 WAS 1M IL 27.2.80
9	ECO. 1112 R50 WAS 100R IL 14.4.80
10	SEE SHEET 1
11	SEE SHEET 1
12	SEE SHEET 1
13	SEE SHEET 1


+15v
Q8 BC214C
Q7 BC184C
C12 100nF
R33 33k
R32 1K8
C10 470 pF
C13 10µF 25v
R34 10K
-15v
R66 220R
R45 68
C70 33pF
R69 4K7 ·25%
M8 µA 714 HC
R90 200K
R72 33R
R73 1M
R1 8K2 ·25%
C3 470nF
C7 470nF
TL1
TL2
TL3
TL4
R2 1K18 1%
R3 590R 1%
R4 294R 1%
R5 147R 1%
O/P COM
J1-12
Q3 U3114E
TL5
ISOL O/P.
J1-13
R46 4K7
C24 4p7F
R70 2K7
C22 10pF
D8 HSCH1001/1N6263
TP5
SEE NOTE 1
R7 430k
R6 16k ·25%
R8 390k
D2 1N458A
To R9/Q4 (SHT 1)
C23 10pF
R47 4K7 ·25%
C25 4p7F
R71 2K7
D9 HSCH1001/1N6263
R49 9K1
FROM M11-6 (SHT 1)
R67 18K
R48 8K975 ·25%
R50 50R
Q13 BC214C
Q6 2N39
Q14 BC184C
C17 100nF
R53 33K
R54 12K
C20 10µF 25v
R52 1K2
R29 220R
R68 18k ·25%
M9 µA 714 HC
TP6
C11 10µF 25v
J1-15
0v
J1-14
To J4 AN PCB
R103 220R
C14 10µF 25v
TP7
J1-16

S LTD. NORWICH

SECTION

DRAWING SIZE	
A1	
DRAWING No	SHEET
430402	2 OF 2

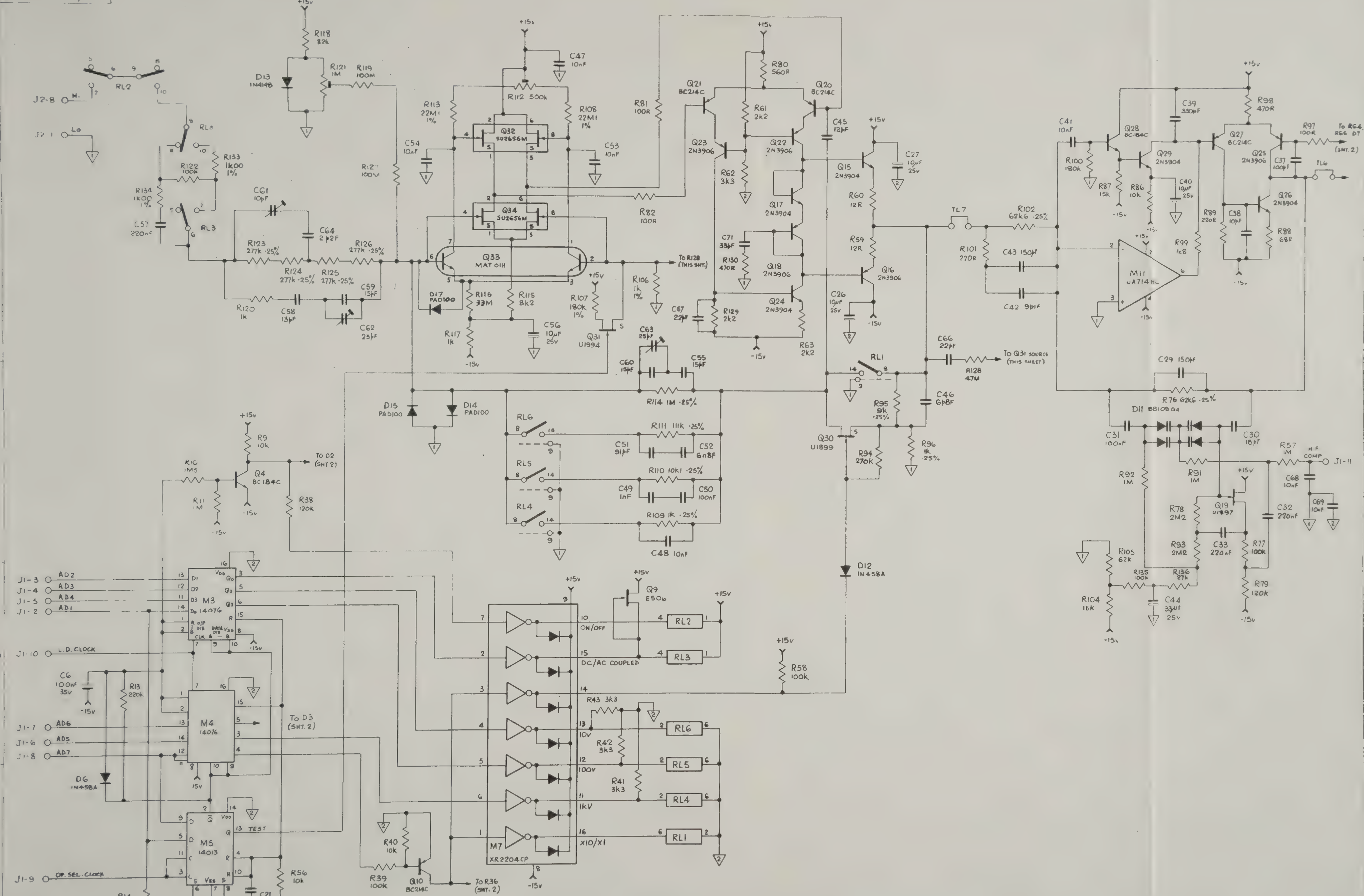
DRAWING No
430402
FIRST USED ON 1061/1071

THIRD ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES



+15v
R118 82k
D13 1N4148
R121 1M
R119 100M
RL2
J2-8 Hi
J2-1 Lo
RL3
R133 1k00 1%
R122 100k
R134 1k00 1%
C57 220nF
C61 10pF
C64 2p2F
R123 277k ·25%
R124 277k ·25%
R125 277k ·25%
R126 277k ·25%
R120 1k
C58 13pF
C59 15pF
C62 25pF
R127 100M
R113 22M1 1%
R112 500k
R108 22M1 1%
C47 10nF
C54 10nF
C53 10nF
Q32 SU2656M
Q34 SU2656M
Q33 MAT 01H
D17 PAD100
R116 33M
R115 8k2
R117 1k
-15v
C56 10µF 25v
R107 180k 1%
Q31 U1994
R106 1k 1%
To R128 (THIS SHT.)
R81 100R
R82 100R
Q21 BC214C
Q20 BC214C
R80 560R
R61 2k2
Q23 2N3906
Q22 2N3906
R62 3k3
Q17 2N3904
Q18 2N3906
Q24 2N3904
C71 33pF
R130 470R
C67 22pF
R129 2k2
R63 2k2
C45 12pF
Q15 2N3904
Q16 2N3906
R60 12R
R59 12R
C27 10µF 25v
C26 10µF 25v
C63 25pF
C60 15pF
C55 15pF
R114 1M ·25%
D15 PAD100
D14 PAD100
RL6
RL5
RL4
R111 111k ·25%
C51 91pF
C52 6n8F
R110 10k1 ·25%
C49 1nF
C50 100nF
R109 1k ·25%
C48 10nF
TL7
R102 62k6 ·25%
R101 220R
C43 150pF
C42 9pF
C66 22pF
R128 47M
To Q31 SOURCE (THIS SHEET)
RL1
C46 6p8F
R95 9k ·25%
Q30 U1899
R94 270k
R96 1k ·25%
D12 1N458A
R58 100k
C41 10nF
R100 180k
Q28 BC184C
Q29 2N3904
R87 15k
R86 10k
C40 10µF 25v
C39 330pF
M11 µA714HC
R99 1k8
R89 220R
C38 10pF
R88 68R
R98 470R
Q27 BC214C
Q25 2N3906
Q26 2N3904
C37 100pF
R97 100R
To R64, R65 D7 (SHT. 2)
TL6
C29 150pF
R76 62k6 ·25%
D11 BB109G4
C31 100nF
C30 18pF
R57 1M
H.F. COMP
J1-11
C68 10nF
C69 10nF
R92 1M
R91 1M
Q19 U1897
C32 220nF
R78 2M2
R93 2M2
C33 220nF
R77 100k
R105 62k
R135 100k
R136 27k
R104 16k
C44 33µF 25v
R79 120k
R9 10k
R10 1M5
Q4 BC184C
To D2 (SHT 2)
R11 1M
R38 120k
J1-3 AD2
J1-4 AD3
J1-5 AD4
J1-2 AD1
M3 14076
J1-10 L.D. CLOCK
C6 100nF 35v
R13 220k
M4 14076
To D3 (SHT. 2)
J1-7 AD6
J1-6 AD5
J1-8 AD7
D6 1N458A
M5 14013
TEST
J1-9 OP. SEL. CLOCK
R14 33k
C21 100nF
R56 10k
R40 10k
R39 100k
Q10 BC214C
To R36 (SHT. 2)
M7 XR2204CP
Q9 E506
ON/OFF
DC/AC COUPLED
R43 3k3
R42 3k3
R41 3k3
10v
100v
1kV
X10/X1
RL2
RL3
RL6
RL5
RL4
RL1

ISS	CHANGES
1	RELEASED TO PRODᴺ IL 17.9.79
2	ECO. 956. 957 R10 WAS 220k R11 WAS 18k R13 WAS 33k C6 WAS 680nF SEE ALSO SHEET 2 IL 8.10.79
3	ECO 953 996 R11 WAS 120K R127 100M ADDED D13 WAS OA47 B.J 24-10-79
4	ECO 999 1007 R117 WAS 100R M4/11 + 12 LINKED C44 WAS 1µF C56 WAS 10µF C34 WAS 10µF C46 WAS 2p2F C65 + C66 ADDED R81 WAS 100R R82 WAS 1k R128 ADDED SEE ALSO SHT. 2 IL 1.11.79
5	ECO. 1011. 1016 1036 C45 WAS 3p3F C46 WAS 10pF C34 WAS 22µF TANT C65 REMOVED C66 WAS 220pF R128 WAS 15M R81. R82 WERE 330R C56 WAS 100µF D10 REMOVED C67 R129 ADDED R104 WAS 10k R105 WAS 68k C64 WAS 3p3F IL 2.1.80
6	ECO 1058 C68 + C69 ADDED IL 23.1.80
7	ECO 1069 SEE SHEET 2 IL 15.2.80
8	SEE SHEET 2
9	ECO 1112 1113 C71, R130, R133, R134 ADDᴰ SEE ALSO SHEET 2 IL 14.4.80
10	ECO 1133 D17 ADDED IL 13.6.80
11	ECO 1160 R135 + C72 ADDED
12	ECO 1190 D11 WAS MVAM-2 C30 WAS 13pF IL 5.1.80
13	ECO 1201 1207 C34 + C72 DELETED R136 ADDED C39 WAS 100pF C44 WAS 10µF C45 WAS 10pF C46 WAS 8p2F R79 WAS 110k Q28 WAS 2N3904 IL 8.4.81

IL
RJW
20.8.79
DATE 3.9.79

DIMENSIONS IN MILLIMETRES
NOT TO BE SCALED

TOLERANCES ANGULAR ± °
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± .005
DECIMAL TO 2 PLACES ± .010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED

MATERIAL —
FINISH —

datron ELECTRONICS LTD NORWICH

TITLE 1061/1071 AC - PREAMP

DRAWING SIZE A1
DRAWING No 430402
SHEET 1 OF 2

DRAWING No 430402
FIRST USED ON

THIRD ANGLE PROJECTION

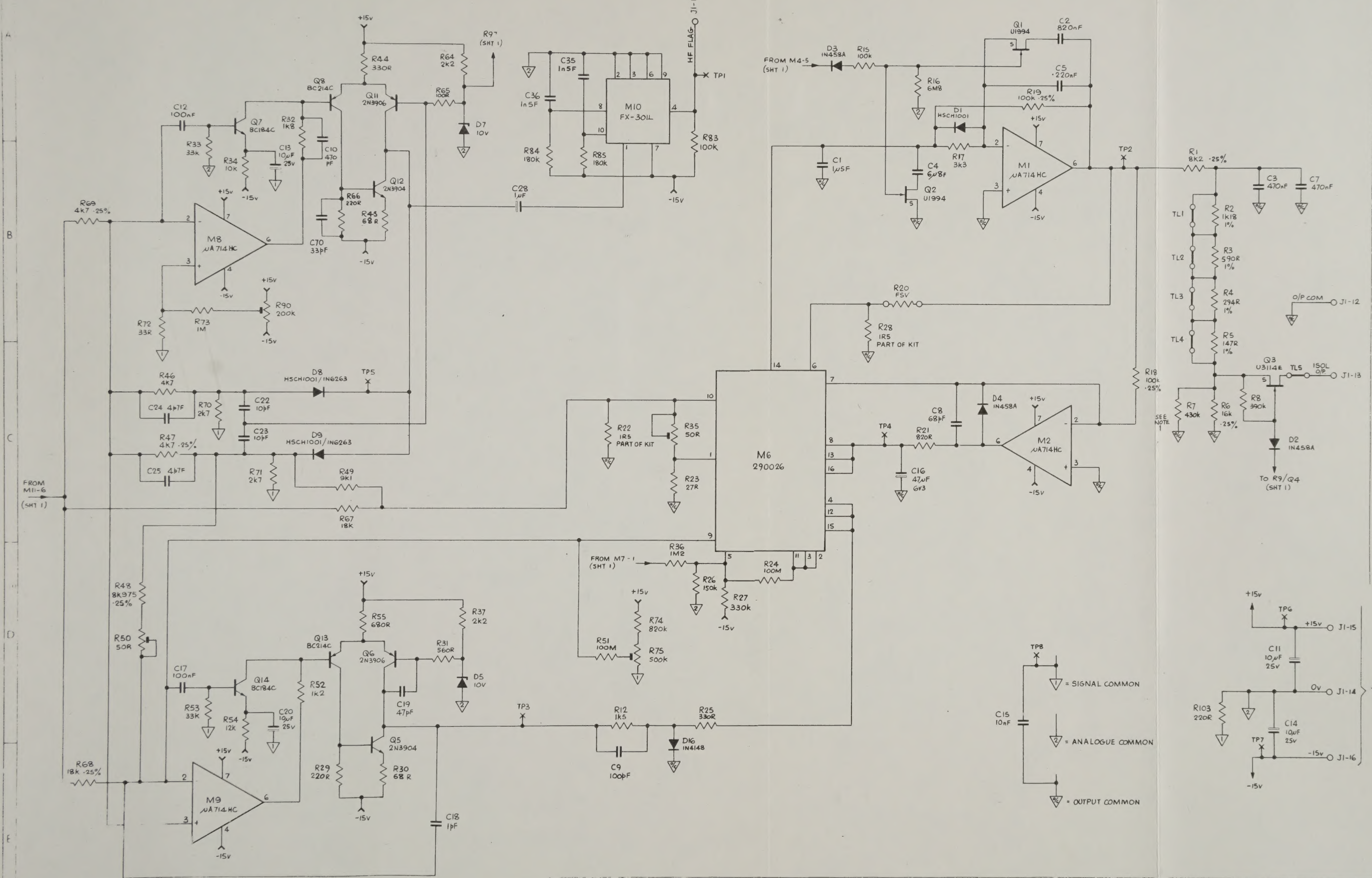
DRAWN IN ACCORDANCE WITH BS 308

ALL BURRS TO BE REMOVED

NOTES

1 RESISTOR R7 IS NOT FITTED ON A.C. ASSEMBLIES USED IN 1061'S INSTRUMENTS

ISS	CHANGES
1	RELEASED TO PRODN IL 17.9.79
2	ECO 956 C2 WAS 680nF IL 8.10.79
3	SEE SHT 1 24-10-79 B.J
4	R83 WAS 10k R74 WAS 1M5 D16 ADDED IL 1.11.79
5	ECO. 1011 1016.1036 R26 WAS 180k R7 WAS 1M. IL 2.1.80
6	SEE SHEET 1
7	ECO. 1069 R70 WAS 680R R71 WAS 680R C70 ADDED IL 14.2.80
8	ECO 1082 R27 WAS 680k R36 WAS 820k R74 WAS 1M IL 27.2.80
9	ECO. 1112 R50 WAS 100R IL 14.4.80
10	SEE SHEET 1
11	SEE SHEET 1
12	SEE SHEET 1
13	SEE SHEET 1



+15v
-15v
R44 330R
R64 2k2
R97 (SHT 1)
Q8 BC214C
Q11 2N3906
R65 100R
D7 10v
C12 100nF
Q7 BC184C
R32 1K8
C10 470 pF
R33 33k
R34 10K
C13 10µF 25v
Q12 2N3904
R66 220R
R45 68R
C70 33pF
R69 4K7 ·25%
M8 µA714HC
R90 200K
R72 33R
R73 1M
C35 1n5F
C36 1n5F
M10 FX-301L
R84 180k
R85 180k
HF FLAG J1-1
TP1
R83 100k
C28 1µF
FROM M4-5 (SHT 1)
D3 1N458A
R15 100k
R16 6M8
Q1 U1994
C2 820nF
C5 ·220nF
R19 100k ·25%
D1 HSCH1001
R17 3k3
C1 1µSF
C4 6µ8F
Q2 U1994
M1 µA714HC
TP2
R1 8K2 ·25%
C3 470nF
C7 470nF
TL1
TL2
TL3
TL4
R2 1K18 1%
R3 590R 1%
R4 294R 1%
R5 147R 1%
O/P COM J1-12
Q3 U3114E
TLS
ISOL O/P J1-13
R8 390k
D2 1N458A
To R9/Q4 (SHT 1)
R7 430k SEE NOTE 1
R6 16k ·25%
R18 100k ·25%
R20 FSV
R28 1R5 PART OF KIT
M6 290026
R46 4K7
C24 4p7F
R70 2k7
C22 10pF
C23 10pF
D8 HSCH1001/1N6263
TP5
R47 4K7 ·25%
C25 4p7F
D9 HSCH1001/1N6263
R71 2k7
R49 9K1
FROM M11-6 (SHT 1)
R67 18K
R22 1R5 PART OF KIT
R35 50R
R23 27R
TP4
R21 820R
C8 68pF
D4 1N458A
M2 µA714HC
C16 47µF 6V3
R36 1M2
FROM M7-1 (SHT 1)
R26 150k
R27 330k
R24 100M
R48 8K975 ·25%
R50 50R
R55 680R
R37 2k2
Q13 BC214C
Q6 2N3906
R31 560R
D5 10v
C17 100nF
Q14 BC184C
R52 1K2
R53 33K
R54 12K
C20 10µF 25v
C19 47pF
R74 820k
R75 500k
R51 100M
TP3
R12 1K5
R25 330R
D16 1N4148
C9 100pF
Q5 2N3904
R29 220R
R30 68R
R68 18k ·25%
M9 µA714HC
C18 1pF
TP8
= SIGNAL COMMON
= ANALOGUE COMMON
= OUTPUT COMMON
C15 10nF
TP6
+15v J1-15
C11 10µF 25v
0v J1-14
To J4 AN PCB
R103 220R
C14 10µF 25v
TP7
-15v J1-16

IL
RL 10 APPROVED
DATE 20 8 79 3 9 79
DIMENSIONS IN MILLIMETRES
NOT TO BE SCALED
TOLERANCES ANGULAR ±
INCH DIMENSIONS
DECIMAL TO 3 PLACES ± 005
DECIMAL TO 2 PLACES ± 010
FRACTIONAL ± 1/64
METRIC DIMENSIONS
DECIMAL TO 2 PLACES ± 1mm
DECIMAL TO 1 PLACE ± 2mm
WHOLE DIMENSIONS ± 4mm
UNLESS OTHERWISE STATED
MATERIAL —
FINISH —

datron ELECTRONICS LTD. NORWICH

TITLE 1061 / 1071 A C RMS SECTION

DRAWING SIZE A1
DRAWING No 430402
SHEET 2 OF 2

datron

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Tlx: 22104

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